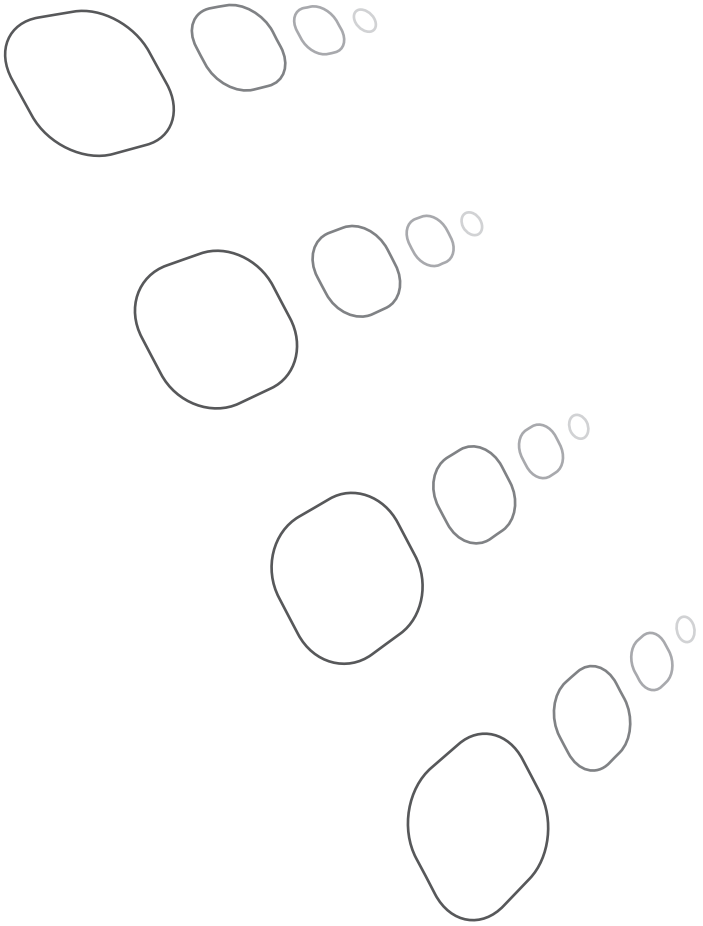

MLT FX

User Guide

Version 5.2

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This manual is revision B

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Conventions Used

Symbols

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Information: Additional hardware or software information which may be useful.

Tips: Useful hints and advice when undertaking tasks.

Notes: System, software and workflow points to consider and remember.

See: Reference to other items in this document or in other documents.

Text

<Text>	indicates a specific key press on the QWERTY keyboard.
Text/text	indicates a genQ menu function/option or an <F1> Configuration Window menu/setting. The first letter is either upper case or lower case to match the genQ GUI.
NN/nn	indicates a value entered on a numeric keypad.
Text/text	indicates either a Quantel control panel function or a Windows/ Quantel installation/system setting.

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This guide covers software available on some Quantel standalone and server connected systems. It may cover functions or options not available on the system you are using.

This guide was written and published by Quantel. The bottom of each page displays the guide's reference number, eg **2116-59-040** plus a revision letter eg **E** ('E' being more recent than 'A' which is the original). The publish date is also indicated in the format **mm/yy.** If you require hard copies of a guide, always quote its reference number, revision letter and title.

2140-57-006

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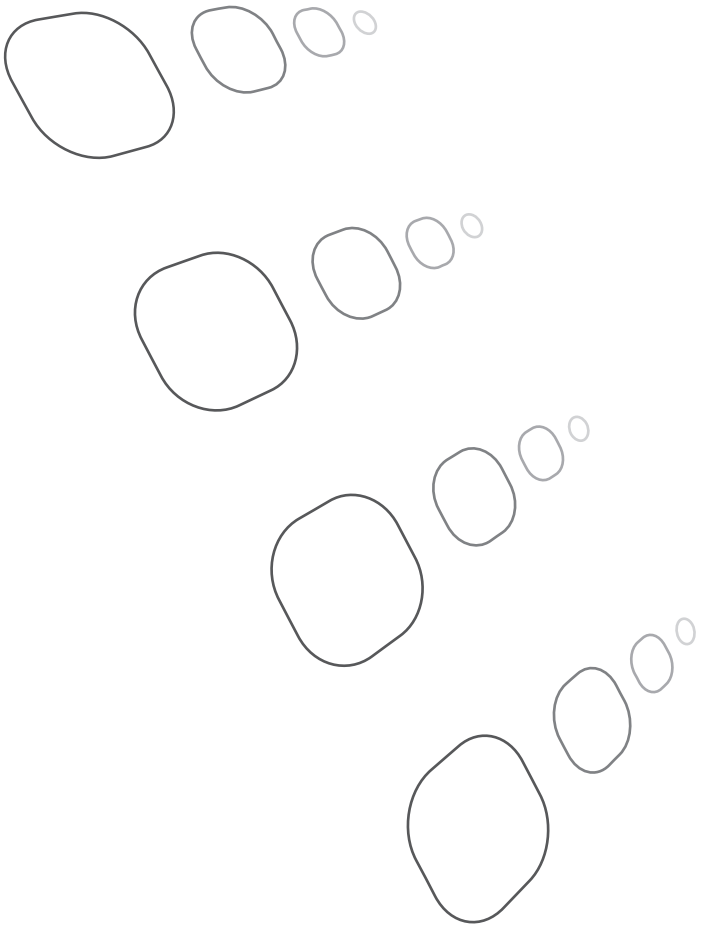

1

Overview

The *mlt fx* menu within the Edit application allows Effects processes including *dve, graphics, key* and *blur* to be applied to individual clip segments, video tracks or the whole timeline.

The *stereo* process is detailed in the separate Stereo3D User Guide.

The *colour* process is detailed in the separate Grading User Guide.

Overview

This document describes the processes within MLT FX. For general editing techniques and details of how to use the multilayer timeline, refer to the Editing User Guide.

The *mlt fx* menu within the Edit application allows processes to be easily applied to individual clip segments, video tracks or the whole multilayer timeline.

If you press the *mlt fx* box in the bottom-left of the Edit menu area, of processes are displayed in the 'stack' on the left of the menu area above the timeline.

Processes include *colour, dve*, *key*, *blur*, *graphics*, *text, plug-ins* and *stereo*. The *stereo* process functions are detailed separately in the Stereo3D User Guide and the *colour* process is detailed separately in the Grading User Guide.

This user guide does not cover the *stereo* and *colour* processes. See Stereo3D User Guide and Grading User Guide for details.

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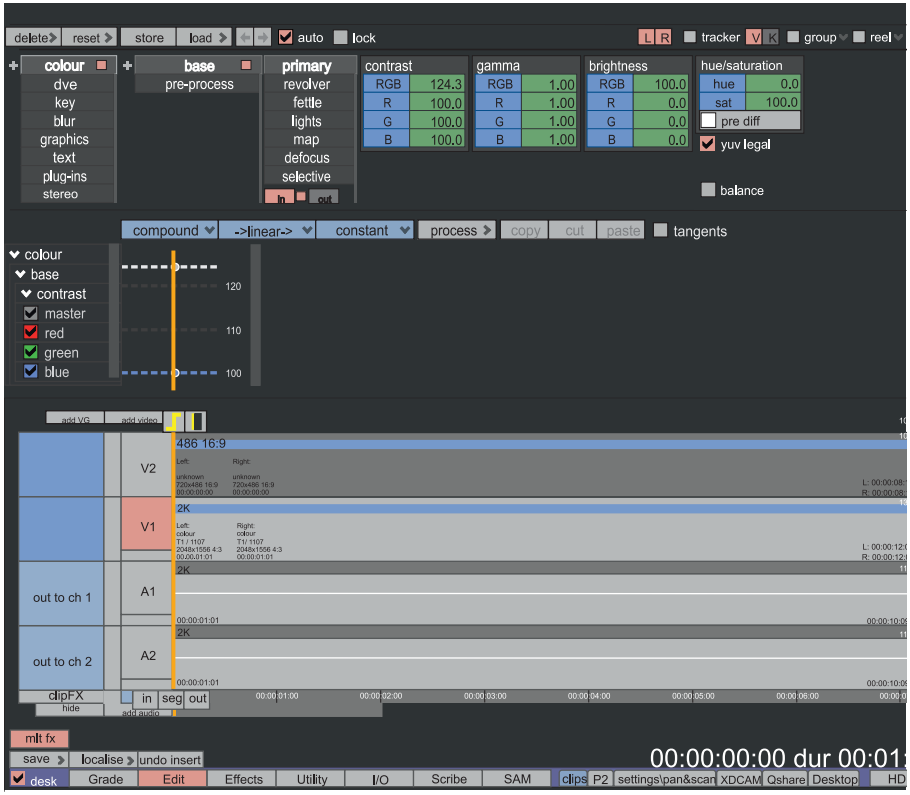
Menu Display

MLT FX process menus are displayed in a stack above the timeline and keyframe graph area (if the graph is expanded). The *delete, reset, store, load* and render format controls are displayed above the stack across the menu area.



Colour defaults to being first in the stack.

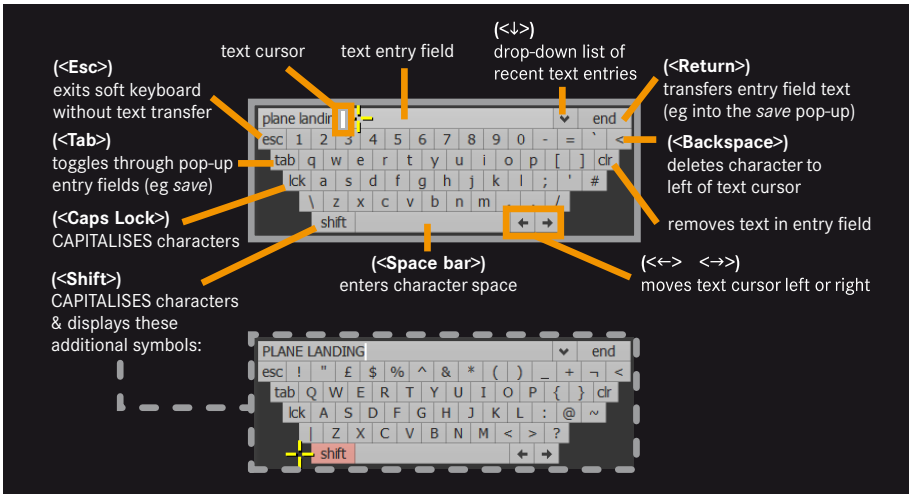
Basic Menu Functions

When a GUI menu function is referred to in this guide, it is *italicised* to distinguish it from descriptive text. Usually, to select a menu function you press on its box with the cursor. These boxes are coloured to indicate function type and status, as described below.

pink — Pink boxes indicate enabled or selected functions. Most pink boxes toggle to grey.

grey — Dark grey boxes may indicate that the function is available but requires a video or key channel.

Light grey boxes indicate disabled or non selected functions. Most of these boxes toggle to pink. Light grey is also used in blank fields that require text entry such as a name or category (eg the *save* pop-up). When a field is pressed, a soft keyboard pops-up allowing text to be entered:



The diagram above shows the soft keyboard functions with corresponding external keyboard functions in brackets.

orange — Orange boxes indicate that an operation has been aborted for the indicated reason, or also as a reminder to undertake an action, eg to perform a render or add a keyframe.

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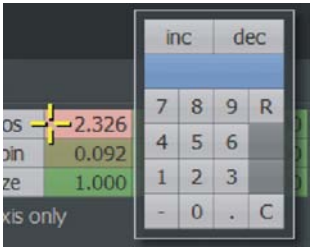
blue

Dark blue boxes contain information that cannot be changed such as a function name or description. Light blue boxes provide scroll lists containing alternative selections. Press down and hold on the box with the cursor and while continuing to hold, move up or down the list until the required item is highlighted. Release pressure to select the item.

green

Green boxes indicate that a numeric value can be changed. If pressed, the box becomes pink and a numeric pop-up appears. When a change has been entered, the box becomes olive green to indicate this. Values can be changed by doing one of the following:



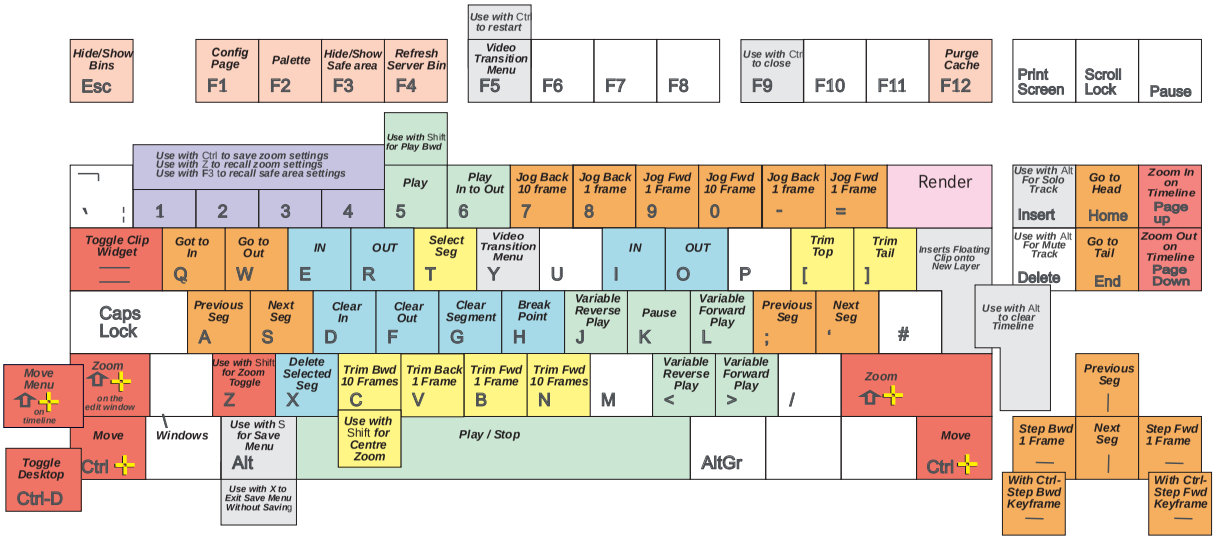
a Use the cursor to press the *inc* and *dec* boxes or numbers on the pop-up. The new value appears in the blue box at the top of the pop-up. Tap on this box to transfer the value, then tap on it again to close the pop-up (or press <Return> on the external keyboard). If required, press the *C* box to clear the value, or the *R* box to reset the green numeric box to its default value.

b Enter a number on the external keyboard then press <Return> to transfer the value and close the pop-up.

c Press and drag the cursor in a clockwise circular movement over a green numeric box to increase the value (you don't have to press the box first to display the pop-up) or an anti-clockwise movement to decrease it. You can also drag up or down to increase or decrease the value.

Specific numeric values can be entered using the following external keyboard shortcuts:

<B>	inserts the biggest allowed value for the selected parameter
<S>	inserts the smallest allowed value for the selected parameter
<D>	inserts the default value for the selected parameter
<Space>	inserts a zero value into the selected parameter.



- **Ctrl+Z** undo
- **Ctrl+R** redo
- **Ctrl+Shift+Home** default layout
- **Ctrl+Shift+T** Server Bin clip name pop-up
- **Ctrl+Shift+S** select Server Bin 'areas' box
- **Ctrl+Shift+B** focus on Server Bin
- **Ctrl+Shift+F** focus on Edit timeline
- **Ctrl+Return** show Server Bin clip docked to Edit Window
- **Ctrl+Shift+Return** show Server Bin clip docked to Edit Window with history

- **Windows+D** Windows desktop
- **Alt+Tab** scroll through Windows applications
- **Alt+S** save clip (or segment) in the Clips Bin
- **Alt+Return** single/double clear timeline
- **Alt+Insert** solo top-most selected video and audio track

- **Shift+** ↓ or ↑ adjust audio level on segment
- **Ctrl+Shift+** ↓ or ↑ adjust audio level on all segments in track
- **Ctrl+** ↓ or ↑ move Server Bin clip selector
- **Alt+** ← or → bwd/fwd bin focus in nested bins

Note that these are commonly used shortcuts: for a complete list of shortcuts see the MLT FX and/or Editing User Guides.

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MLT FX keyboard map

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Overview

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Configuration Window

<F1>	opens/closes the Configuration Window.

Layout

<F3>	displays/hides the safe area (ie orange outlines) in the Edit Window.
<Ctrl>+<⇧>+<Home>	switches to 'default layout', which forces the following actions: *launch Edit application; clear timeline; close MLT FX; delete all Floating Clips; remove copies of Server Bin (but not original); dock Server Bin with Clips Bin; focus on Server Bin; move bins to top-left of desktop and resize to 35% of screen width; change bin view to 'title' (ie not 'browse'); clear clips docked to Edit Window*.
<Z>+<Shift>	toggles zoom levels.
<1>, <2>, <3>, <4>	use with <Ctrl> to save zoom settings, use with <Z> to recall zoom settings and use with <F3> to recall safe area settings.

Editing

<Tab>	toggles focus between the timeline and the Floating Clip.
<Ctrl>+<⇧>+<F>	switches focus to timeline.
<Alt>+<Return>	performs single clear of timeline: press twice to double clear the timeline (ie resets timeline horizontal/vertical scale, number of tracks and default frame rate as set in the <F1> Configuration Window's *Fps* drop-down).
<Return>	if a Floating Clip or Clips Bin clip is selected, pressing this key (press twice for Clips Bin clip) places the clip on the timeline at the current timeline cursor position overwriting any overlapping media. If *insert* is ticked (or the <Insert> key pressed), the existing media is split and moves along the timeline accordingly (referred to as 'insert edit'). If *sync* is ticked, a Floating Clip can be placed onto the timeline with its cursor point matching the cursor point on the timeline clip (see 'Synchronising Frame Position' previously in this chapter).

<Ctrl>+<Return>	performs an 'insert edit' regardless of whether the *insert* function is enabled or disabled (see previous <Return> shortcut).
<H>	inserts a break point at the current timeline cursor position.
<Q>	jumps to the currently selected in point.
<W>	jumps to the currently selected out point.
<E>, <I>	marks an in point at the current timeline cursor position.
<R>, <O>	marks an out point at the current timeline cursor position.
<T>	marks the current segment selected by the current timeline cursor position.
<D>	clears the currently assigned in point.
<F>	clears the currently assigned out point.
<G>	clears the currently selected segment.
<P>	extends the end of a clip segment from its current position to the current timeline cursor position.*
<C>	placing the timeline cursor on an edit point then pressing this key trims back 10 frames from this edit point. If the timeline cursor is placed elsewhere, pressing this key moves the edit point to the current timeline cursor position and trims from there.
<V>	placing the timeline cursor on an edit point then pressing this key trims back 1 frame from this edit point. If the timeline cursor is placed elsewhere, pressing this key moves the edit point to the current timeline cursor position and trims from there.
<B>	placing the timeline cursor on an edit point then pressing this key trims forward 1 frame from this edit point. If the timeline cursor is placed elsewhere, pressing this key moves the edit point to the current timeline cursor position and trims from there.

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<N>	placing the timeline cursor on an edit point then pressing this key trims forward 10 frames from this edit point. If the timeline cursor is placed elsewhere, pressing this key moves the edit point to the current timeline cursor position and trims from there.
< [>	placing the timeline cursor after an edit point then pressing this key trims (ie 'tops') the start of the clip segment to the current frame.
<] >	placing the timeline cursor before an edit point then pressing this key trims (ie 'tails') the end of the clip segment to the current frame.
<F2>	displays/hides the paint palette which allows colours to be selected and mixed.
<F5>, <Y>	displays the Video Transition Menu that allows a cut, dissolve, wipe or custom transition to be selected. The actual settings used for the wipe, dissolve or custom transition (eg a wipe shape and its position about the edit point) are those previously set in the Trim/Transition Window (see Editing User Guide for more information); but these can be changed as required.
<Alt>+<Insert>	soloes the upper selected video and audio track.
<Alt>+<Delete>	mutes/un-mutes selected video and audio tracks.
<Alt>+<S>	opens the timeline *save* pop-up: press twice to save current clip to Clips Bin.
<Alt>+<T>	toggles between *save* pop-up's *clip* and *storyboard* boxes.
<Alt>+<X>	closes the *save* pop-up without saving the clip.

Audio

<Alt>+<1>	toggles the audio track filter (A1) on/off.
<Alt>+<2>	toggles the audio track filter (A2) on/off.
<Alt>+<3>	toggles the audio track filter (A3) on/off.
<Alt>+<4>	toggles the audio track filter (A4) on/off.

<⇧>+<↑>	increases audio level on selected segment.
<Ctrl>+<⇧>+<↑>	increases audio level on all segments in the track.
<⇧>+<↓>	decreases audio level on selected segment.
<Ctrl>+<⇧>+<↓>	decreases audio level on all segments in the track.
<Alt>+<Insert>	soloes the upper selected video and audio track.
<Alt>+<Delete>	mutes/un-mutes selected video and audio tracks.

Navigation & Play-back

<Space Bar>	starts/stops playing the clip edit currently on the timeline.
<→>	steps the current frame position on the timeline clip forwards 1 frame.
<←>	steps the current frame on the timeline clip backwards 1 frame.
<↓>, <S>, < ' >	steps the current frame on the timeline to the next edit point (or next logged event).
<↑> ,<A>, < ; >	steps the current frame on the timeline to the previous edit point (or previous logged event).
<J>, < , >	plays the clip backwards from the current frame on the timeline. Repeated presses increase the speed by 1, 2, 4, 8, 16 or 32 frames.
<K>	pauses the playing clip.
<L>, < . >	plays the clip forwards from the current frame on the timeline. Repeated presses increase the speed by 1, 2, 4, 8, 16 or 32 frames.
<5>	plays the clip forwards at normal speed.
<6>	plays the clip forwards at normal speed from the currently selected in point to the currently selected out point.
<7>	jogs backwards 10 frames through the clip from the current frame on the timeline.

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<8>	jogs backwards 1 frame through the clip from the current frame on the timeline.
<9>	jogs forwards 1 frame through the clip from the current frame on the timeline.
<0>	jogs forwards 10 frames through the clip from the current frame on the timeline.
<Home>	jumps to the first frame on the timeline.
<Page Up>	zooms-in on the timeline around the current frame. Repeated presses increase the zoom.
<End>	jumps to the last frame on the timeline.
<Page Down>	zooms-out on the timeline around the current frame. Repeated presses decrease the zoom.

Undo & Redo

<Ctrl>+<Z>	undoes the last operation.
<Ctrl>+<R>	redoes the last operation that was undone.

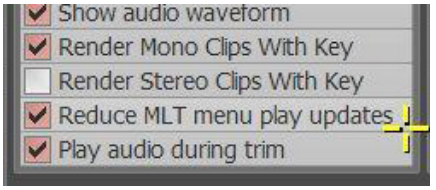
Bins

<Alt>+<←>	moves focus left on nested Clips/Server Bins.
<Alt>+<→>	moves focus right on nested Clips/Server Bins.
<Esc>	hides/shows all open media bins on the desktop.
<F4>	refreshes the Server Bin.
<Ctrl>+<↑>, <↓>	moves Server Bin clip selector.
<Ctrl>+<⇧>+<B>	switches focus to Server Bin.
<Ctrl>+<⇧>+<S>	selects Server Bin 'Areas' scroll box.
<Ctrl>+<⇧>+<T>	shows Server Bin clip naming pop-up (ie soft keyboard).
<Ctrl>+<Return>	shows selected Server Bin clip docked to Edit Window.
<Ctrl>+<⇧>+<Return>	shows Server Bin clip docked to Edit Window with history.

Play-back

MLT FX has a player that allows real-time play-back of processes. The level of performance is determined by the number of Media Engines available on the platform. If the effects or number of layers become too great, the clip simply plays more slowly.

The player can play unrendered material smoothly backwards or forwards in MLT FX. You cannot hear audio when playing unrendered material; you must fully render the clip first.



Select the <F1> option *Reduce MLT menu play updates* to improve player performance with unrendered effects. This prevents any updates when playing in MLTFX, eg Keyframe parameters changing and processes updating across edit points.

Resolutions above 2K are not supported for real-time preview and must be rendered first. This does not apply to soft-mounted RED media that may be 4K. In this case the RED preview mode in the <F1> Configuration Window is used.

To hear audio or for play-back in the Edit or I/O applications, the timeline must be rendered first.

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Rendering

Making a Playable Clip

When to Render Clips

When an edit is assembled on a video track on the timeline, no new video frames are created. The edit plays-back smoothly without stuttering so you don't have to render it before to make it 'playable'. However, if you do one of the following on a clip segment, new frames must then be created by pressing the *render* function in order to make the clip playable:

a Create a video transition between 2 segments.

b Create an MLT FX (or Effects) process on a segment.

c Create a Quantel template (see 'Templating').

d Publish a segment to an sQ Server (see 'Publishing').

e Stretch video via the Floating Clip or timeline *video stretch* function. Note that the *render* function for this is on the associated pop-up, not the timeline.

Segments that need rendering are indicated by a different colour on the timeline. The colour depends on the history of the clip; see 'Timeline Clip Segment Information' further in this chapter for details.

How to Render

When rendering is required, the small box on the top-right of the timeline (above the red and green solo and mute buttons) turns orange, as shown in this screen shot.

Press this orange box to render all unrendered segments (press this together with <Ctrl> to render mixed formats); a progress bar appears above the clip segments being rendered.

Auto Render (<F1>)

You can choose to render 'simple' transitions automatically by selecting *UI – Auto Render* in the <F1> Configuration Window. A 'simple' transition is defined as follows:

a It does not overlap an unrendered **segment** containing MLT FX, ie 'Seg FX'. If the segment 'effect' has been rendered, it becomes 'simple' and renders.

b It is not within a rendered or unrendered **track** containing MLT FX, ie 'Track FX'.

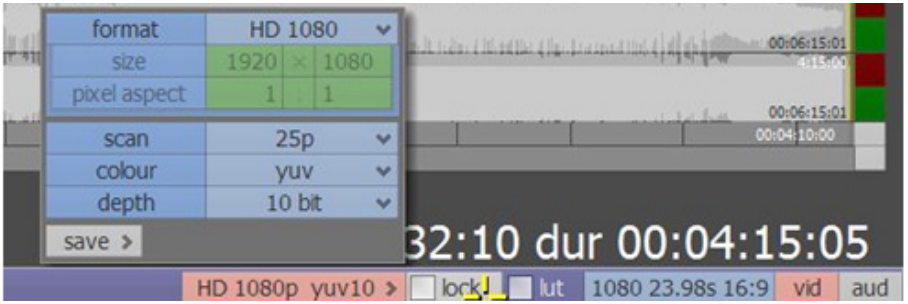
c It is not within a rendered or unrendered **clip** containing MLT FX, ie 'Clip FX'.

MLT FX Render Format (Mixed Resolution)

An edit consisting of the same video format is rendered at it's native resolution. When there are mixed resolution clips, transitions, fades, or an MLT FX *dve* or *stereo* process applied, you must choose the format that you want these mixed frames to render to.

To set the render format, do the following:

1 Press the video format box on the bottom-right of the Application Bar. This opens a pop-up.



2 Select the required format from the blue scroll box to the right of *format*.

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3 Specify other settings in the pop-up if required. You need to set the parameters in the render format pop-up to match the required video format for the final clip:

format	specifies the generic video format; eg SD 576 4:3, SD 576 16:9, SD 486 4:3, SD 486 16:9, HD 720, HD 1080, 2K 1556, custom.
size/pixel aspect	only adjustable if *custom* format is selected.
scan	specifies either *interlaced* or *progressive*.
colour	specifies the colour space of the rendered material.
depth	specifies the bit-depth of the rendered material.

4 You can lock this setting (by ticking *lock*) to the current video format setting on the right.

5 Press *save.*

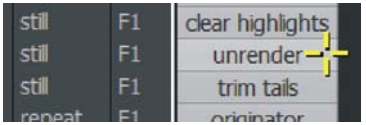
Soft Mounted Media

Soft mounted media can be edited in the same way as any other media, except that it is at preview resolution and not the full render/localise resolution. If soft mounted media is rendered, only the rendered frames are written to the local workspace.

If you want to re-edit the media or access its history accessed, the original media needs to be available online or the original rushes localised first.

Unrender MLT FX via Clips Bin

Rendered MLT FX history can be unrendered from the Clips Bin.



This is useful for reducing the size of archives so that only the original media with its MLT FX metadata is stored; therefore saving disk space.

To unrender history from the Clips Bin do the following:

1. Open the Clips Bin and select the clip you want to change.
2. Press on the clip name to open the entry options menu.
3. Press *unrender* and then *confirm*.

See 'Flat Timeline– Rendering' in the Editing User Guide for more details of render format controls and rendering.

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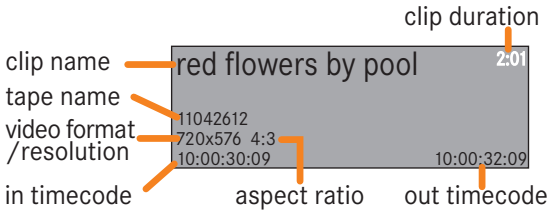
Timeline Clip Segment Display

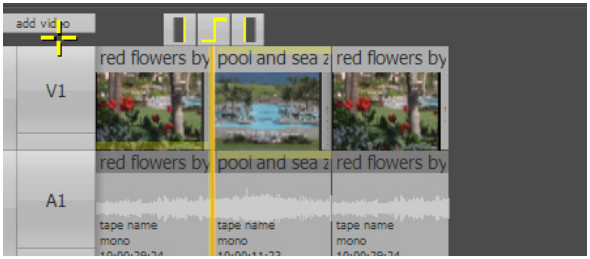


When the vertical scale is sufficient, each video and audio segment includes specific information about the segment's origin.

Audio segments also indicate audio content (ie mono, stereo, quad etc as defined at recording).

The file name and path can be displayed on the timeline for any file based material by ticking the *File name* box in the *Clips* menu of the <F1> Configuration Window.

Enabling Segment Thumbnails



If you tick *Show pics* in the <F1> Configuration Window's *Editor* menu, a thumbnail frame appears on each segment, providing that the vertical scale of the track is sufficient.

Colours/Highlights

Segment colours on the Edit timeline's video layers indicate useful information including where the segment originated and any associated history, eg a process change in Effects or MLT FX. Note that when rendering is required, an orange bar appears in the dark grey area ABOVE the clip segment.

segment with unrendered multiple layer **Effects** history.

segment with rendered multiple layer **Effects** history.

multilayer (MLT) server-held segment that is subsequently viewed on non-MLT seat (eg sQ Cut).

unrendered **Effects** template has been applied.

rendered **Effects** template has been applied.

segment with unrendered single layer **Effects** history.

segment with rendered single layer **Effects** history.

unrendered segment with **MLT FX** history.

rendered segment with **MLT FX** history.

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segment containing input key created using *dve, key*, third party graphics template option, or other plugins.

soft-mounted/remotely held media segment and/or sQ Server held segment (on sQ Server systems you can disable soft-mount indication via the *Remote Media Indicator* box in the <F1> Configuration Window's *Clips* menu; this indicator then only appears for sQ Server held segments).

soft-mounted segment with unrendered single layer **Effects** history.

unrendered soft-mounted segment with **MLT FX** history.

unrendered segment being edited using the <F8> or 'One Shot' menu.

segment that has been stretched then rendered using the *video stretch* pop-up.

segment that is part of an **MLT FX** group.

stereo3D segment.

Video/Key Controls

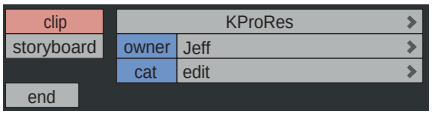
Clip segments with associated keys are shown on the timeline with a red bar. The *V* and *K* boxes in the top-right of the menu area control whether a video or key channel is rendered.

If the *K* box is dark grey, this indicates that there is no key channel on the currently selected clip segment.

With *Preview clip with key* selected under the *System* menu (in the <F1> Configuration Window) any clip with an associated key that is unrendered will only preview on the desktop. Deselect this option to play without stuttering, showing just the fill video and not the combine.

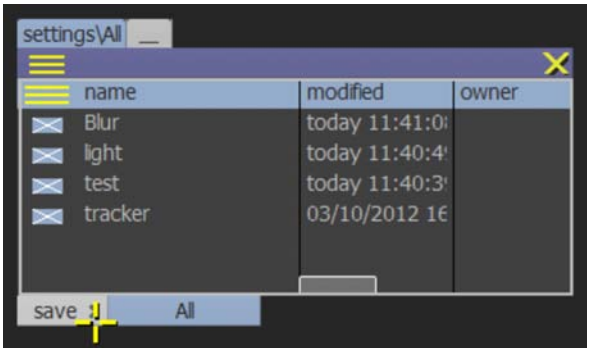
Saving

The contents of the timeline (including any processes) can be saved in the Clips Bin by pressing the *save* box in the bottom-left corner of the menu area.



A pop-up appears allowing the title, owner and category to be entered for the edit.

Press the *end* box to action the save or re-select the *save* box to close the pop-up without actioning the save.



If you want to save processes or transitions without the associated media, use the Settings Bin to save and apply settings to future projects. See the Editing User Guide for more information about using the Settings Bin.

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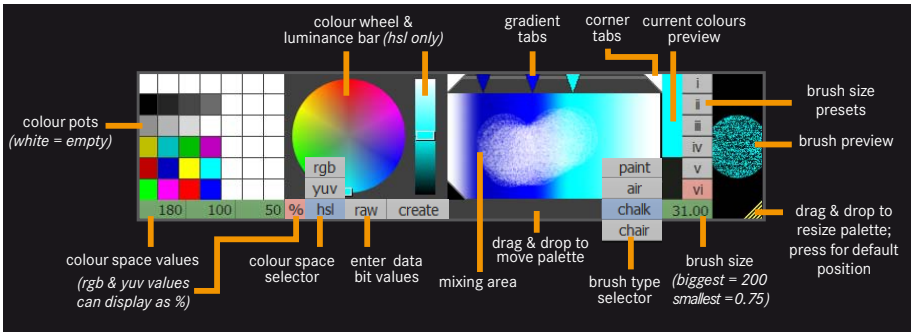
Colour Palette

Using the Colour Process

See the Grading User Guide for more information about using the Colour process.

Using the Colour Palette

Press <F2> on the keyboard to toggle the Colour Palette on and off, or alternatively in the <F1> Configuration Window's *UI* menu, tick *Palette Swipe* to toggle the palette whenever the pen is swiped down or across the tablet.



The palette enables colours to be created and transferred to colour pots in processes such as *text* or *graphics*. Mixed colours can be stored in the palette and saved. The palette may display extra functions depending on the current process; these are noted throughout this section.

Creating & Mixing Colours

There are many different ways to create colours; each is described in the sections below.

A – Using the Brushes

1 Choose a brush from the scroll box displaying *paint, air, chalk* and *chair* (chalk-airbrush). For mixing, the *chalk* and *chair* brushes provide the best results when overlapping colours.

2 Change the brush size by tapping on a preset, or entering a numeric value. The brush preview displays the new brush.

3 Tap on the required colour pot and paint a line in the mixing area to the right, then tap on another colour and paint another line slightly overlapping the first; new tones appear in the areas of overlap. Repeat this with more colours if necessary.

B – Using Graduated Colours

As well as mixing by using brushes, you can select subtle tones from graduated colours.

1 Select a colour pot then press and hold on one of the 4 corner tabs surrounding the mixing area (these are white and black by default). The colour now displays in the tab and the mixing area; repeat for the other 3 tabs to create a 4 colour ramp effect.

2 To introduce colours on a linear gradient, select a colour pot then press on the grey line above the mixing area. A tab appears indicating the colour and its position in the mixing area. If you move this tab, the position of the colour moves with it.

3 Repeat this process adding new colours and tabs as necessary. To delete a colour, select the tab and drag it down into the mixing area.

C – Using Numeric Values

In some processes such as *text, graphics* and *colour*, you can select a colour from a pot or the mixing area then change its numeric values in the 3 green boxes. Hold down on a colour pot in the palette or tap a pot in the process menu area to transfer it.

D – Using Colour Spaces

In HSL mode, the colour wheel appears (see previous diagram) with a small square cursor to enable colour and hue selection. The slider to the right controls the luminance (brightness) of the colour.

The blue scroll box at the bottom of the palette allows working colour space values to be entered as either *rgb* (red, green, blue), *yuv* (luminance, blue-luminance, red-luminance), or *hsl* (hue, saturation, luminance).

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When enabled, the *%* box that appears in YUV and RGB modes allows colours to be defined as percentage values and when disabled, colours are defined as actual data bit values (eg with 8-bit RGB the 100% value is 255. 255. 255).

The *raw* box allows colours to be entered as actual data bit values of the native colour space.

E – Using Image Area or Colours (create & pick)

If you enable the *create* box, a rectangle lasso appears that can be positioned over the image area. When you click, the image inside the lasso area is copied to the palette mixing area. These image colours can then be selected and changed like any other palette colour.

In some processes such as *text, graphics* and *colour*, you can transfer an image colour to the palette by enabling the *pick* box that appears in the top-right of the palette. Press on an image colour and now paint it in the palette or store it in a pot.

When entering numeric values or mixing colour spaces, it is possible to create illegal colours that must not be transmitted. These include negative values of RGB, zero values of U or V, and saturated colours on very low or peak luminance levels. If an illegal colour is detected or created, the *raw* box turns orange as a warning.

Storing & Transferring Colours

Select a colour from a palette pot or the mixing area.

To store a new colour in the palette, press and hold on an empty (ie white) pot. On cursor release, the colour displays in the pot.

To transfer a new colour to a process function (eg *graphics*), tap on the required pot in the process menu area.

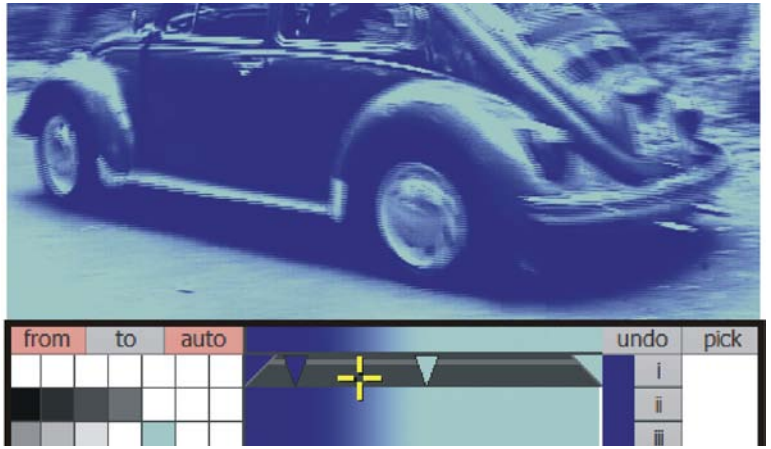
Colouring the Image

In the *colour* process, the *from, to* and *auto* functions appear, as well as an *undo* function on the right.

The *from* and *to* functions allow the image to be modified by the contents of the palette mixing area. The left side of the mixing area affects the lowlights of the image and the right side affects the highlights:

1. From any function in the *colour* menu, create a 2 colour graduation in the palette by dropping 2 colours on the top left and right corner tabs.

2. Press *from.* The image updates with the 2 colours replacing the original low and high values of the image. The *map* function box in the *colour* menu now enables automatically (as a simple colour map has been created). Note that you can press *auto – from* which automatically changes the image whenever a colour is changed.



3. Reverse the colours by pressing *map – invert* if required.

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4 You can now introduce more colours to affect the midtones of the image by adding gradient tabs along the top of the mixing area and dragging them until the required effect is achieved. You can also paint in the mixing area to create a more contrasting image. Remember to press *from* after introducing each colour (if *auto – from* is not enabled).

5 If you have changed the palette but want to transfer the current map on the image back into the palette, press *to*.

Saving Palettes (Palettes Bin)

Palettes can be saved into the Palettes Bin for future use by pressing the *palettes* box on the Application Bar. This opens the bin and allows the current palette to be saved by pressing *save* at the bottom of the bin. Palettes can also be deleted or renamed by choosing a title in the bin then selecting the corresponding box on the right. Existing palettes can be applied by selecting one from the bin and dragging and dropping it onto the current palette.

Resetting the Palette

If you have replaced the preset colours in a palette by mistake, or want to 'clean' the mixing area, you can restore the original palette. Select *palettes* on the Application Bar and when the bin has opened, drag and drop the palette named 'standard' onto the current palette. Note that corner tabs are reset, but any tabs on the grey line remain.

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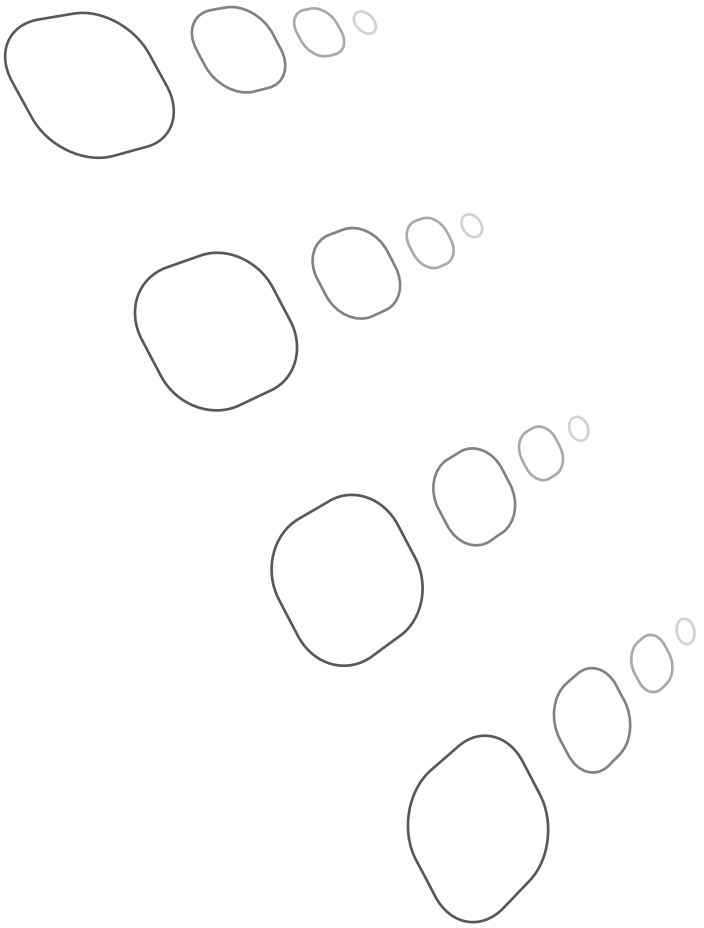

2 Managing Processes

MLT FX allows you to re-order processes using the menu names. Processes can be transferred using the Settings Bin, Storyboard or Stillstore. Processes can be keyframed for dynamic changes.

There are also various zoom and display tools available.

Using Process Menus

Applying a Process

On the top-left of the menu area, press on the required process box to display its menus to the right. If a change is made, the process title displays a small box to the right with a pink highlight indicating that a change has been made within this process.

If a stereo clip is loaded, each process (except the *stereo* process itself which contains left/right functions) has two square boxes.

See 'Stereo3D User Guide' for more information.

Creating Multiple Processes, Shapes & Cascades (+)

You can create multiple processes by doing the following:

1. Press the '+' box to the top-left of the process menu (see screen shot).

2. Select the process you want to use from the list that appears. The new process now transfers to the process stack with a number to the right of it. A scroll bar may appear as the stack becomes longer.

3. Apply the process, eg make another colour change. The selected box now turns pink.

In menus with shapes (eg *graphics, blur, colour, key*), you can add a new shape by pressing + to the left of the generic shape stack. Press + again to toggle between the individual shape stack and the generic shape stack.

Similarly in the *key* menu, you can add a new cascade level by pressing + to the left of the cascade stack.

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Renaming Processes, Shapes & Cascades

Any process, shape or cascade can be renamed simply by clicking on the name you want to change and using the hard or soft keyboard to enter a new name.

Disabling & Enabling Processes

The square box to the right of each process name can be pressed to enable/disable the process, eg *dve* can be disabled to allow adjustment of the *key* process.

To 'mask' a process from the output, press the pink box; the box then turns light-grey. To 'unmask' a process, press the light-grey box which then returns to pink.

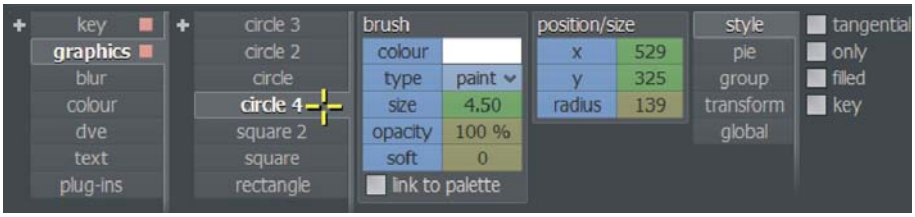
With all boxes on (pink), the full effect of the processes can be seen on the current frame.

Duplicating Processes & Settings

Press on the required process box, eg *colour*, then press <Shift> and drag up to create a copy of the process and its settings.

Re-ordering Processes & Shapes

You can re-order MLT FX processes by simply dragging and dropping a previously applied process (eg *dve*) up or down the stack. The top process is the last process in the chain (*colour* is first in the stack by default).



Process menus that provide shapes (eg *graphics, blur, colour, key*) allow you to pull forward or push back previously created shapes by dragging the shape name box up or down the stack (see screen shot above showing *circle 4* being placed below previously drawn circles).

The shape at the top of the stack is placed in front of other shapes and the shape at the bottom is behind the others.

Resetting & Deleting Processes

Selecting the *reset* box followed by a process menu or parameter resets the values back to their default, but leaves any keyframes in place.

Selecting the *delete* box followed by a process menu, eg *blur,* deletes this process for the currently selected clip segment or video track.

Display Tools

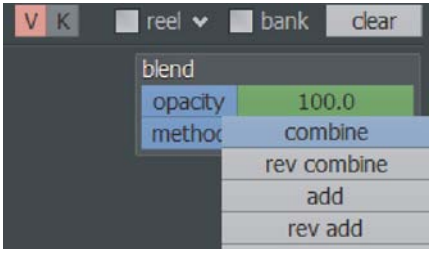
Luma Channels (RGB)

Under the Edit Window, there are luma channel selectors: *R*, *G* and *B*.

By default none of the channels are selected which means all the channels (R, G and B) are displayed in the Edit Window.

If one of the luma channel selectors is pressed, only the selected channel is displayed in the Edit Window. This can be useful during correction to determine which channel has the most noise in it.

Blend Modes



On the right of the process menu area the *blend* menu is displayed. The modes accessed from the *method* scroll box allow you to affect how the video layers interact (how they appear when one is placed over the other).

The value in the green *opacity* box controls the transparency/opacity of the video track. The value of 100.0 being totally opaque and the value of 0.0 being totally transparent.

Some of the available modes are shown in the following examples at 100% opacity.

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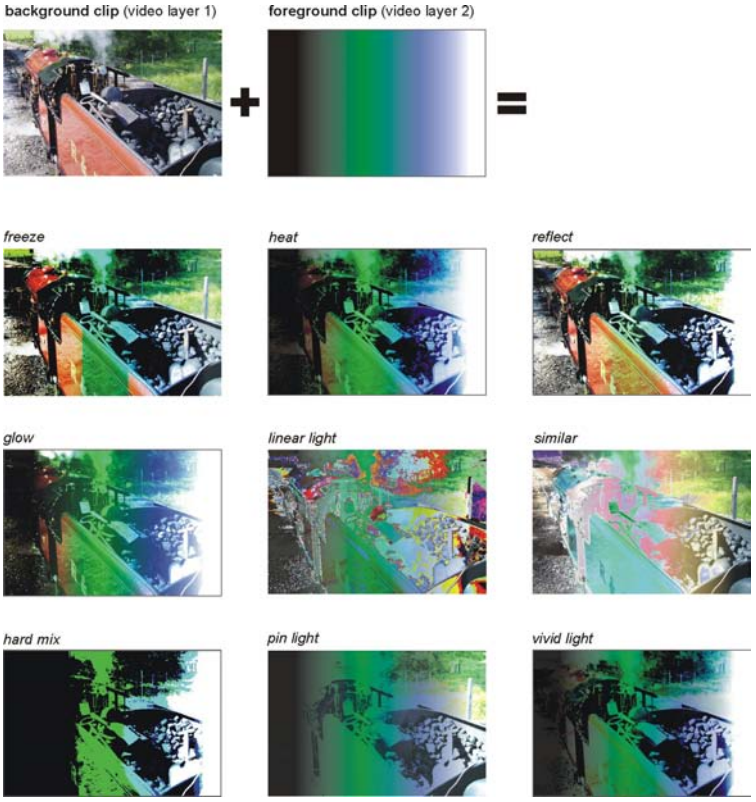
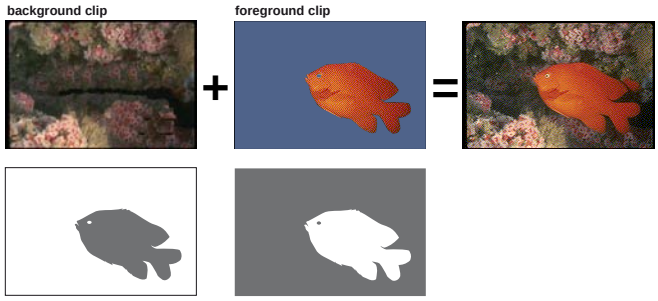
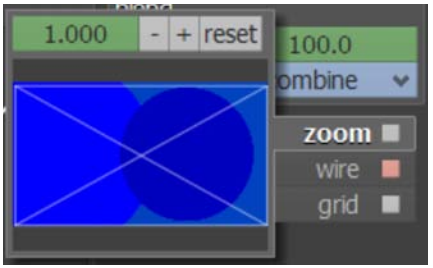


Note that the *combine* mode uses the video track's key channel to cut a hole in the video track below (or the combination of lower video tracks and background). The foreground video track is then placed in this hole:



The *rev combine* mode reverses/inverts the video track's key channel and uses it to cut a hole in the video track below (or the combination of lower video tracks and background). The foreground video track is then placed in this hole.

Zooming/Repositioning



Press the *zoom* box on the right of the process menu area to display the zoom pop-up.

When a zoom has been applied, the light-grey box turns pink.

You can zoom in and out using any of the following methods:

a Enter a numeric value in the green box and press <Return>.

b Press the '+' or '-' buttons.

c On the Edit Window, press <Shift> + drag up/drag down. This method can be used without opening the zoom pop-up.

You can reposition the image area by either pressing and dragging on the box within the pop-up (this represents the image area) or pressing <Ctrl> + dragging on the Edit Window.

Press *reset* to return the image position and zoom to its default (1.000).

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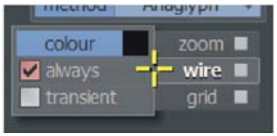
Wire Mode



Press the *wire* box on the right of the process menu area to display the wire pop-up.

This wire colour is used where processes use positional outlines and cursors or when highlighting items (eg *dve, text* and *graphics*).

You can set the wire colour by selecting one from the palette then pressing the box to the right of *colour* in the pop-up to transfer it (<F2> toggles the palette on/off). With *transient* ticked, the wire only displays when the cursor is over the image area, whereas ticking *always* displays the wire regardless of cursor position.

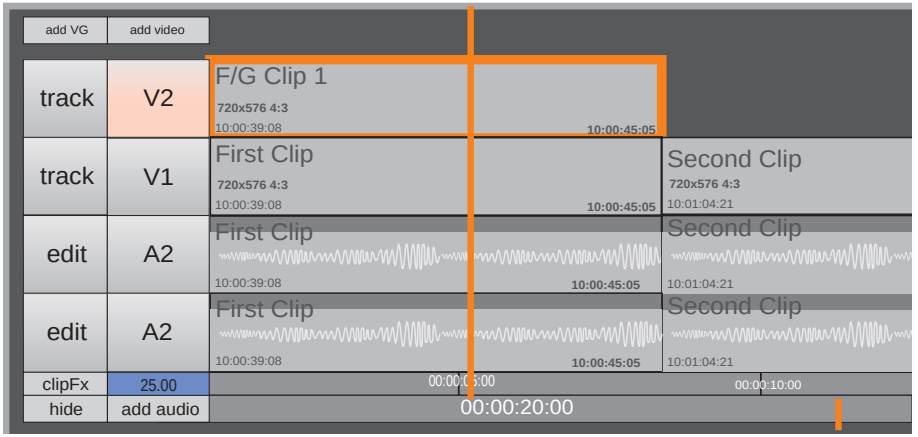
Grid Display

Press the *grid* box on the right of the process menu area to display a grid over the image area.

Enter the grid spacing/frequency you require in the green numeric boxes and select whether you want to snap objects to horizontal, vertical or both lines of the grid by ticking the *x snap* and/or *y snap* boxes.

Applying Processes to a Seg, Track or Clip

Timeline Controls



You can apply a process to a segment (or specific multiple segments), to a track, or to the whole edit:

a Press on a segment (or multiple segments) to apply any subsequent process to those segment(s), ie 'Segfx'.

b Press the *track* filter box on a video track (eg V1, V2, etc) to apply any subsequent process to this track only (ie 'Trackfx).

c Press the *clipFX* box to apply any subsequent process to the whole timeline (all the video tracks, ie 'Clipfx').

These three methods are described in the next sections.

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Seg FX

You can select a single segment, multiple single segments or blocks of segments on the timeline that are on different tracks. You can do this on mono and stereo media.

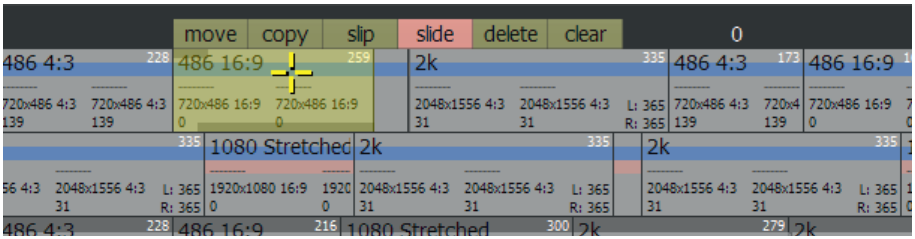
Selecting an Individual Segment

There are two ways to select an individual segment. You can either:

a Double-click on the segment you want to select

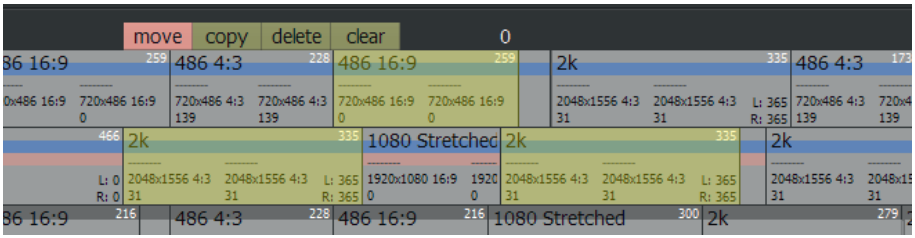
OR

b Hold down <Ctrl> and single-click on the video segment you want to select.



Selecting Multiple Single Segments

You can select multiple single segments over different tracks by holding down <Ctrl>. Now click once on each segment you want to select.



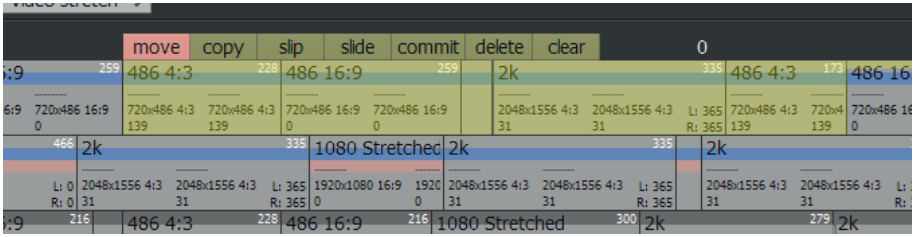
Selecting a Block of Segments

To select a block of segments on the same track, do the following:

1 Double-click on the first segment.

2 Hold down <Shift>.

3 Click on the last segment you want included in the block.



The yellow ‘move’ menu now appears above the highlighted segments.

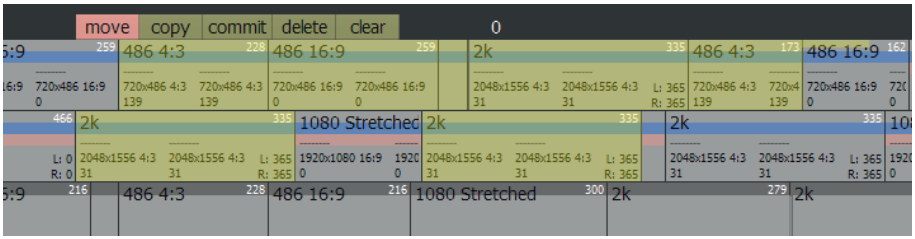
Selecting Single Segments & a Block

You can select single segments on different tracks in addition to a block. Do the following:

1 Select a block of segments (see previous section).

2 Hold down <Ctrl>.

3 Click on each single segment you want to add.



The single segments and block are now highlighted yellow.

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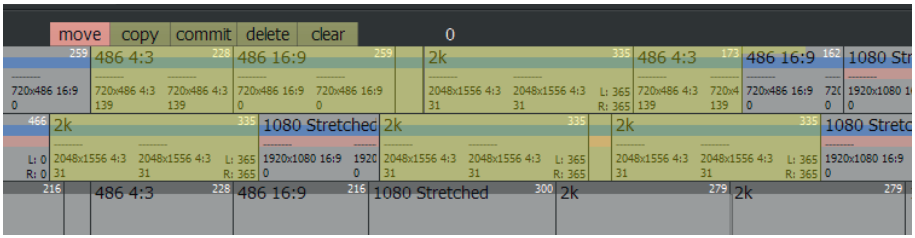
Selecting Multiple Blocks & Multiple Single Segments

To select multiple blocks and multiple single segments, do the following:

1. Double click on the first segment
2. Hold down <Shift> and click on the last segment in the block you want to select.
3. Hold down <Ctrl> and click on a single segment.
4. Hold down <Ctrl> and select the single segment that you want to start the new block.
5. Hold down <Shift> and click on the last segment you want in the block.



To select an additional block of segments, hold down <Ctrl> and press on the first segment. This indicates the start of a new block.

Clearing Single & Multiple Selections

To deselect single segments hold down <Ctrl> and click on the segment you want to deselect.

To clear the selection from a whole track, click on the track filter box (eg *V1*) and press *clear* in the yellow 'move' menu.

Disabling Track Selections

When you select a video track using the filter box (eg *V1)*, the selected segments on the other tracks are not visible, and are therefore not affected by any

subsequent action performed using the 'move' menu or any applied processes. Deselect the track filter box to view the other tracks again.

Available 'Move' Menu Functions

When segment(s) are selected (see next section), the yellow '**move**' menu appears with options that you can use on the selected segments.

Move, Copy, Delete & Clear

These functions are available when you select any segment(s): see Editing User Guide for details.

Slip & Slide

These functions are only available when you select adjacent segments (ie next to each other). You can select segments across different tracks, but the segments must be adjacent on each track.

When segments are moved in this way, the keyframes are also moved. Holding down the <Ctrl> key together with *Slip* or *Slide* leaves keyframes where they are and moves the video. Holding down <Ctrl> and <Shift> together with *Slip* or *Slide* leaves video where it is and moves the keyframes.

Commit

The *commit* function removes the edit point between each video track segment. If two neighbouring segments are committed together, they combine to become one big segment. The commit function is therefore only available when you have multiple segments in a row selected. You can select additional segments on several tracks: if the selected segments are adjacent the commit function operates as normal, but single segments are not affected. When multiple random segments are selected the *commit* function does not appear.

The *commit* function cannot be used on audio tracks/segments.

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Highlighting Selected Segments

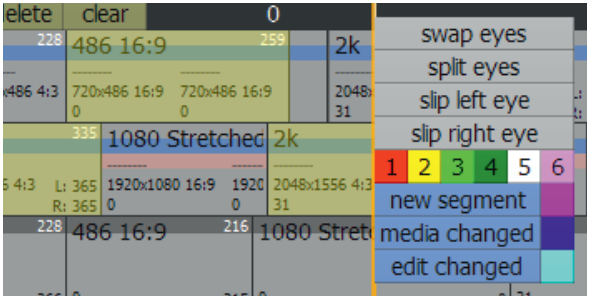
You can apply a highlight to selected segments on the video tracks.

To apply a highlight do the following:

1 Right-click on one of the selected segments.

2 Press on a highlight colour in the pop-up. All the selected segments now highlight in the selected colour.

There are 9 colours you can choose from. Three of the colours are already assigned:



pink/purple indicates *new segment*

blue indicates *media changed*

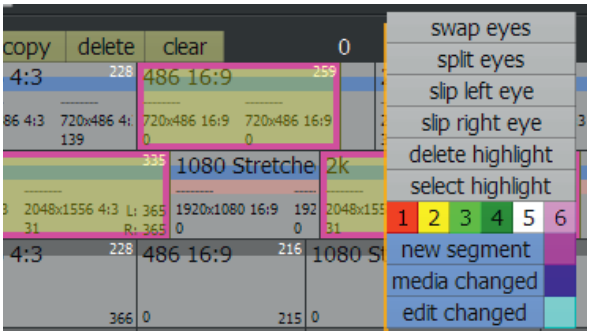
turquoise indicates *edit changed*.

To remove a highlight from a single segment do the following:

1 Right-click on the corresponding segment.

2 Press *delete highlight*.

To remove highlights from all the segments do the following



1 Right-click on a highlighted segment

2 Press *select highlight*. This selected all the highlighted segments.

3 Press *delete highlight*. All the highlights are now deleted.

You can change the highlight colour by selecting all the highlighted segments (see above) and pressing on a new colour.

Applying Processes to Individual or Multiple Segments

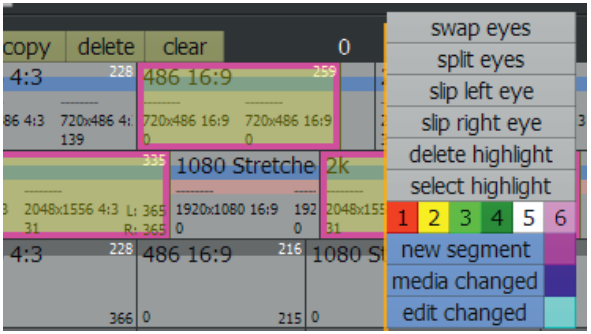
After selecting a single or multiple segments, you can apply an MLT FX process.

Apply the process the same way you would normally, but with the segments selected. The process is only applied to the selected segments. You can change process parameters on a segment by re-selecting it and adjusting the settings in the process menu.

Applying a Process to Highlighted Segments

To apply a process to highlighted segments only, do the following:

1 Right-click on one of the highlighted segments.



2 Press *select highlight*. This selects all the highlighted segments.

3 Apply the MLT FX process with the highlighted segments still selected.

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Track FX

Applying Processes to Individual Tracks

You can apply a process to a single track by selecting the corresponding *track* selection box on the left of the timeline.

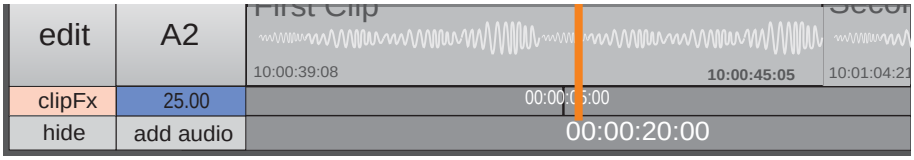
Any MLT FX processes are now applied to the whole video track. To change a process parameter on a track, simply re-select the *track* box and adjust the settings.

By default, processes are applied to the entire track, but you can also apply partial track settings by selecting *track* then marking in and out (blue highlight) before applying a process change.

Process effects can be extended from the end of the clip segment to the current timeline cursor position by pressing the <X> key.

Clip FX

Applying Processes to Timeline



The whole timeline can have processes globally applied by pressing the *clipFx* box on the bottom-left of the timeline. This is useful to apply, eg DVE size and position or a primary colour grade etc.

Saving & Reusing Settings

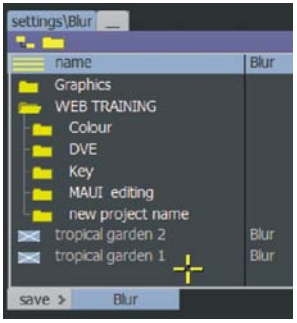
There are several different methods of saving and transferring MLT FX processes (eg blur parameters) between projects. These include the Settings Bin, Storyboard and Stillstore:

Settings Bin

Process settings can be saved and archived independently of the timeline edit via the Settings Bin, then used on other projects as required.

Saving a Settings Clip

To save a settings clip after making the required process changes on the timeline material, do the following:



1. Press the settings tab on the Application Bar to open the Settings Bin.
2. Select the process you want to save, eg *Blur* (or *All* to save all processes) from the blue scroll box at the bottom of the Settings Bin.
3. Press the *save* box on the left and in the soft keyboard pop-up enter the required title.

Note that the Graphics – selection box if enabled, saves only the currently selected shapes (instead of all shapes on the current layer).

4. Press *end* or <Return> . The saved settings clip now appears in the bin with the process type displayed on the right. A blue icon with a cross is displayed on the left.

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Applying a Settings Clip

To apply a previously saved settings clip to the current timeline, do the following:

1. Open the Settings Bin.
2. Select the process you want from the blue scroll box at the bottom, eg *Colour*. All the saved colour settings clips now display in the bin.
3. Drag and drop the required settings clip from the bin onto the Edit Window. The image now updates accordingly and a pink square box appears in the menu area to the right of the process name, indicating a process change.

When transferring *Colour* settings, you can press *insert edit* before dropping the setting onto the image area. This applies only the last keyframe values in the settings clip (eg those for *lift, gamma, gain*) to the current clip at the cursor position. This is useful if you need to transfer the same colour values from the end of one clip to the start of the next. If *insert edit* is not pressed, all the keyframe values (and not just the last) are transferred to the clip regardless of cursor position.

In MLT FX, settings can also be dragged from the Settings Bin and inserted anywhere in the Stillstore for future use (see 'Stillstore' further in this section).

See Grading User Guide for more details.

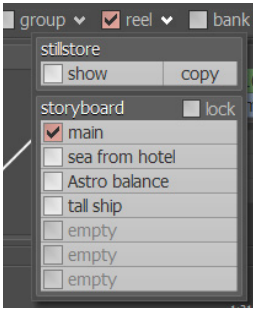
Storyboard

In the Edit application, you can use the Storyboard reel to assemble and move clips for the current timeline edit and to navigate through the edit. In MLT FX the functionality is slightly different; it allows you to preview and transfer single or multiple processes from clips on the Storyboard to the timeline edit and to easily save different Storyboards during a project which can then be used on other projects.

Stereo3D Storyboard Clips

If the Storyboard contains Stereo3D clips, the left eye only is displayed, although both left and right eye processes are stored and can subsequently be applied.

Displaying a Storyboard



To display the Storyboard, select the *reel* tick box on the top-right of the menu area. The first frame of each clip in the current timeline edit (ie the main Storyboard) now appears as tiles along the reel display; if the timeline is empty, no clips appear along the reel.

If you want to display a different Storyboard, press the 'v' arrow on the right of *reel* to display more options (see screen shot), then tick a reel to open it.

You can now scroll along the reel, preview process settings on timeline clips, then apply them if required.

Previewing a Process

Hold down the cursor on any tile to preview these settings on the current timeline clip. Release cursor pressure to hide the preview. Only the settings for the current process are previewed.

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Applying Processes

Each Storyboard clip may contain multiple processes, eg *colour, text* and *dve*. You can then either selectively apply one of these processes or apply all processes to the current timeline clip:

selective — Position the timeline cursor over the required clip, then open a process in the GUI (eg *colour*). Press on the required Storyboard tile then slide the cursor up to apply this process in its current state (ie enabled or disabled) to the timeline clip.

all — To apply all processes in their current state (ie enabled or disabled) and from within any GUI process, position the timeline cursor over the required clip, hold down <Ctrl> and on the required Storyboard tile, slide the cursor up.

Note that a Storyboard tile containing a Stereo3D clip only displays the left eye, but both left and right eye processes are stored and subsequently applied.

Saving, Loading & Deleting a Storyboard

During a project, you can save multiple Storyboards as required. These can then be used on other projects. Do this by selecting the *save* box in the bottom-left of the menu area, then select *storyboard* in the pop-up and enter a name. The Storyboard is saved in the Clips Bin and consists of 1 frame for each segment plus all processes and keyframes, which also makes archiving more efficient.

To load a Storyboard (or you can load an edit with processes), so that you can preview/transfer processes to the current project, drag the Storyboard from the Clips Bin and drop it either on the reel display area, or over one of the '*empty*' slots in the Storyboard list. Alternatively, you can drop it over an existing Storyboard in the list to overwrite the existing entry. The new Storyboard's name now appears in the list. You can load a maximum of 6 Storyboards in addition to the current '*main*' Storyboard.

To delete a Storyboard from the reel list only (not the Clips Bin), press *delete* followed by the Storyboard name in the list: you cannot delete the '*main*' Storyboard. To delete a Storyboard from the Clips Bin, select its title in the bin and press *delete* from the column on the right.

Display & Lock Options

Deselect *reel* to hide the Storyboard. To disable the current Storyboard but not the reel display, deselect it via its tick box. Tick *reel* and *show* to display the Stillstore.

By default, the Storyboard is 'unlocked' in relation to the timeline edit. In this mode (ie the *lock* box is not ticked), the Storyboard tiles initially correspond to the clip segments on the timeline but do not scroll with the timeline automatically. This is useful if, for example a process from a clip near the end of the Storyboard needs to be applied to a segment on the timeline that is nearer the start. You can scroll through the Storyboard using the bar on the right in this mode.

If required, tick the *lock* box to synchronise the 'main' Storyboard (you cannot lock a different one) with the timeline, so that during navigation they move together.

Timecode Display

Press on any Storyboard tile's timecode display to switch between destination timecode, source timecode (src) and time of day (tod). Note that timecodes must be enabled in the <F1> Configuration Window's *Clips* menu first.

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Cursor & Frame Colours

A Storyboard clip that contains the current MLT FX process is indicated by the graduated blue outline around the tile. For example, a blur process is indicated when *blur* is open in the GUI, but not when *dve* is open.

The current timeline cursor position is indicated in the Storyboard by the graduated orange outline around the tile. This obscures any other type of clip outline. This turns to graduated yellow if part of a clip group.

A clip segment that is part of the current group is indicated with a cyan outline around the tile.

See Grading User Guide for details of using the 'Group' function to transfer cascades of colour correction.

Navigating & Zooming

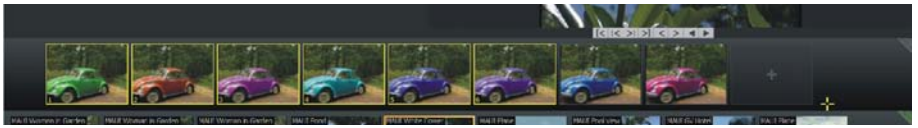
Press on any Storyboard frame and drag left or right or use the arrow keys to step through the reel.

If the Stillstore and Storyboard are both displayed, the Stillstore is displayed above the Storyboard. Both the Storyboard and Stillstore have an icon on the top-right of each display which highlights green to indicate which has current focus (ie which is currently selected/active).

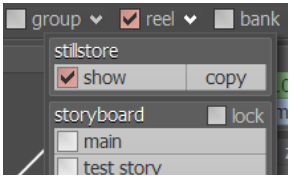
You can drag the icon up or down to increase or decrease the area of the display. Press the icon to return to the default size.

In unlocked mode, use the scroll bar on the right to navigate through the contents and press and hold <Alt> then drag the icon to zoom in/out.

Stillstore



Processes can be selectively or globally applied from the Stillstore to the current timeline clip or transferred from one project to another. You can apply several different settings for a process eg *colour* to the same frame of a clip and then, each time a change is made, save the still into the Stillstore and compare them next to each other.



Tick the *reel* box then press the 'v' arrow on the right. Below *stillstore* tick *show*. Stills now appear above the Storyboard (if enabled) and below the Edit Window. Current stills are indicated by a yellow outline on the display and are numbered 1-6 (although more can be added and displayed).

Stereo3D Stillstore Clips

If the Stillstore contains Stereo3D clips, the left eye only is displayed, although both left and right eye processes are stored and can subsequently be applied.

Previewing a Process

Hold down the cursor on any tile to preview these settings on the current timeline clip. Release cursor pressure to hide the preview. Only the settings for the current process are previewed.

Applying Processes

Each Stillstore clip may contain multiple processes, eg *blur, text* and *dve*. You can then either selectively apply one of these processes or apply all processes to the current timeline clip:

selective — Position the timeline cursor over the required clip, then open a process in the GUI (eg *blur*). Press on the required Stillstore tile then slide the cursor up to apply this process in its current state (ie enabled or disabled) to the timeline clip.

all — To apply all processes in their current state (ie enabled or disabled) and from within any GUI process, position the timeline cursor over

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the required clip, hold down <Ctrl> and on the required Stillstore tile, slide the cursor up.

Note that a Stillstore tile containing a Stereo3D clip only displays the left eye, but both left and right eye processes are stored and subsequently applied.

Saving a Set of Stills

To save the current set of stills, press *copy* in the *reel* menu. A Floating Clip appears that can then be dragged to the desktop or saved in the Clips Bin with '*Stillstore Clip*' as the default name.

Loading Previously Saved Stills

You can drag a saved set of stills from the Clips Bin and drop it onto the Stillstore reel display or the *show* box in the *reel* menu.

Transfer from Settings Bin to Stillstore

Settings can be dragged from the Settings Bin and inserted anywhere within the current Stillstore for future use. Open the Settings Bin, drag the setting from the bin and then drop it over the required position (indicated by the yellow highlight) on the Stillstore reel. The frame with its settings is now inserted into the Stillstore.

Adding New Stills (+)

After you have made a process change, save the new still to the Stillstore by pressing the '+' frame on the reel display.

Deleting Stills

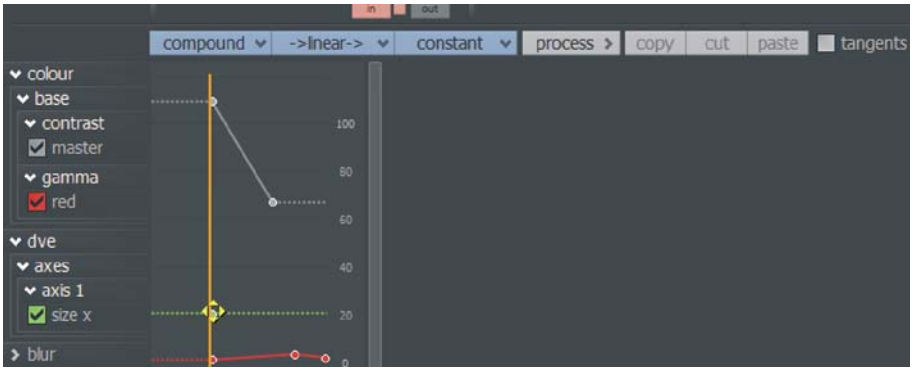
To delete a still, press *delete* then the required still on the reel display. To delete a set of stills, press delete followed by the *show* box on the reel menu.

Navigating & Zooming

See 'Storyboard – Navigating & Zooming' for details of viewing the Stillstore reel.

Using Keyframes

In MLT FX there is a set of keyframe curves for each clip segment, for the whole track and for the whole timeline.



Keyframes appear for each clip segment after a process parameter has been changed. Parameters that define the change between each keyframe can then be adjusted using graphs if required. These graphs display the rate of change of each parameter value (eg size, position, colour etc) against time.

Opening the Graph

Open the graph by right-clicking (<Alt> + tap for pens) or dragging-up the yellow dividing line between the timeline and the process menu area. This also determines the vertical scale of the graphs. Right-clicking again returns the graph to its default position.

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Zooming & Viewing the Graph

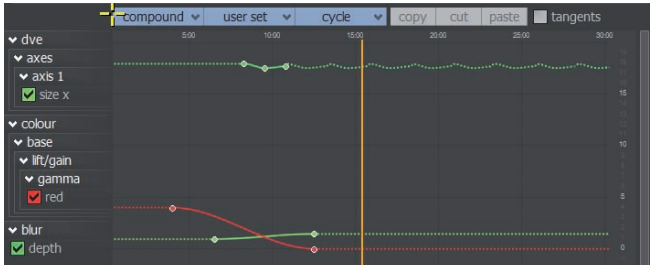
Tapping on the timeline ruler expands the current clip segment to fill the width of the screen; this allows graphs to be adjusted more accurately.

A white bar appears on the timeline ruler to allow scrolling along the whole timeline. Tapping on the white highlight of the timeline ruler returns the display to match the width of the clip segment.

Note that the *zoom* function on the right of the process menu area only affects the view of the image area and not the keyframe graph.

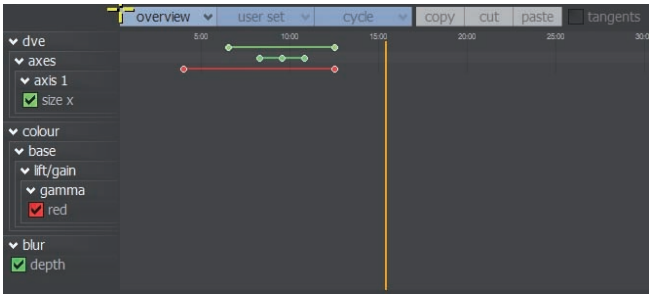
The display of parameters is hierarchical allowing them to be collapsed if required. All keyframes can be seen either altogether, in groups, or individually for each process (eg *dve*). There are 3 modes for viewing the keyframes which can be selected from the blue scrolling box:

compound - where all curves use the same scale:



separate – where each curve is separate and scaled individually:

overview – where the horizontal position of all keyframes is displayed, but without any vertical scale:



Viewing Items in the Parameter Curve Stack

All the parameter curves are defined in the stack to the left of the keyframe graph. You can view a specific keyframe function within a process by either pressing on each title, ie *dve – axes – axis 1*, or open the full list of items at once by pressing <Ctrl> and the title of the items you want to view, ie <Ctrl> + *colour*.

Hiding Parameter Curves

Parameter curves can be hidden by deselecting the corresponding tick box on the left of the graph area. Pressing and holding down on the parameter name toggles a solo view on/off.

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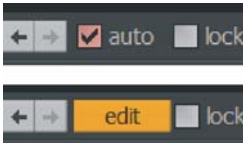
Creating & Editing Keyframes

Inserting Nodes



If you tick the *auto* box, a keyframe node is inserted automatically whenever a parameter is changed. If *auto* is deselected, confirmation is required before any node is inserted. Do this by pressing the orange *edit* box that appears.

With the *auto* box ticked, a parameter change automatically creates a keyframe of the new parameters indicated by a node appearing on the graph. Transitions between the nodes are interpolated on rendering. Nodes are different colours for each parameter – although nodes change to yellow if the *tangents* check box is selected or if a node is selected.

1. To set an initial keyframe (ie start point) for a process, select the required timeline point where you want to start the change

2. Use the process parameter boxes to make the change (eg to *Dve – size*)

3. If required, select another frame and make another change (eg to *size*), then repeat as necessary, or simply move to the frame you want to finish on and make the final change.

You can also insert a keyframe by pressing on the required position on the graph. The timeline cursor moves to this position and the parameter value can now be changed using the green numeric boxes or by dragging the node or curve (with *tangents* on) in the graph display.

Selecting & Deselecting Nodes

Any existing keyframe can be selected then edited by stepping to it using the ← and → boxes (or <Ctrl> + <←> or <→> on the keyboard) then making the required process changes. The keyframe can also be edited using parameter graphs by directly selecting nodes on the parameter's keyframe curve.

Select multiple nodes by dragging a lasso (yellow box) around them. You can select or deselect nodes individually by holding down the <Ctrl> key + tapping on them. This makes it much easier to isolate keyframe nodes for moving or copying.

Moving Nodes

Move a node by placing the cursor on it then dragging it up/down or left/right. This increases or decreases the value for the selected parameter at the current keyframe. The curve between the nodes changes accordingly to provide the best interpolation between all keyframes.

Deleting Nodes

Press the *delete* box in the top-left of the process menu area followed by tapping on the node you want to delete. Alternatively, drag a lasso around the nodes you want to delete then press *delete*. If you press *delete* then tick *keyframe* followed by *all*, all the nodes except the current one are deleted.

Copying Nodes

When you select nodes, the *cut* and *copy* boxes highlight. Choose one of these boxes, then move the timeline cursor to another frame and transfer the cut/copied nodes by pressing the *paste* box.

Grouping Nodes

Groups of keyframe nodes on the graph can be selected (by dragging a lasso around them) and then all moved by the same amount using the box cursor around the lassoed area.

Moving the left or right edges of the yellow box cursor moves the keyframes earlier or later in the parameter effect while the node closest to the opposite edge remains fixed. Moving the top and bottom edges of the yellow box cursor increases or decreases the rate of change between the keyframes while the node closest to the opposite edge remains fixed.

Modifying the Curve (Tangents)

When the *tangents* box is ticked, the nodes turn yellow and 3 coloured lines emanate from the node with a 'handle' on each end. Drag a handle to change the shape of the curve (and therefore how smooth the transition is) as follows:

Drag the end of the yellow line to affect the amplitude of the curve entering and exiting the current node.

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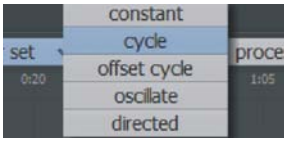
Drag the end of the pink line to affect the curve entering the node.

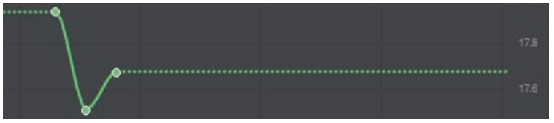
Drag the end of the red line to affect the curve exiting the node.

Keyframe Controller



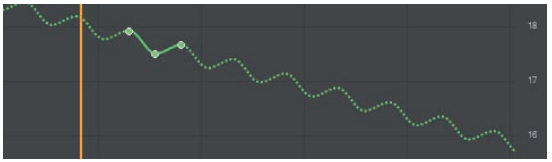
Groups of nodes on the curve can be repeated and modified by using the keyframe controller function selected from the blue scrolling box:

constant – maintains the value of the first and last node in the segment while the nodes inbetween are adjusted.



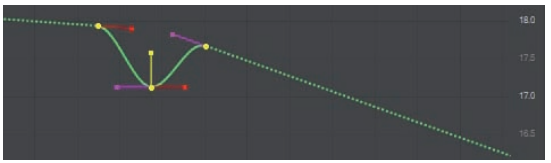
cycle – repeats the selected nodes for the length of the segment.

offset cycle – works in the same way as *cycle*, but the first node position is matched to the last position of the previous cycle.



oscillate – repeats and flips the cycle.

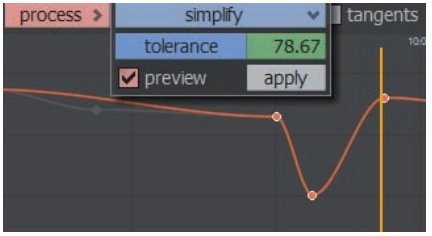
directed – maintains the direction of the curve from the first to last node.



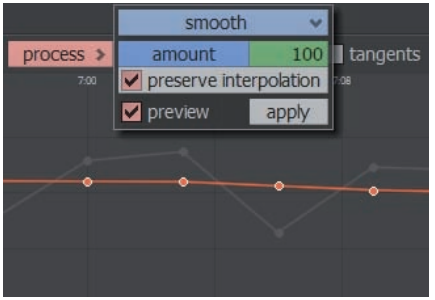
Keyframe Processes (> box)

There are a number of different processes that can be applied to the currently selected keyframe nodes (displayed yellow) to help achieve the desired parameter effect.

Do this by pressing the *process* > box and then select one of the following from the scroll box in the pop-up:



The *simplify* function removes redundant nodes. With the *tolerance* value set to *0* any nodes that are not affecting the overall curve are removed. If the *tolerance* value is increased, more nodes are removed.



The *smooth* function smoothes or 'averages out' the keyframe curve. A high value in the *amount* box results in a smooth graph. By default, smoothing always draws the graph to a default curve, but if a linear interpolation was initially applied that should be kept, *preserve interpolation* must be checked first.

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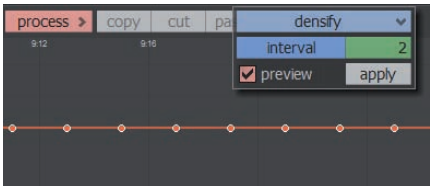
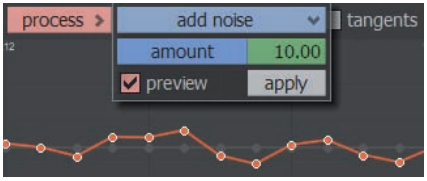
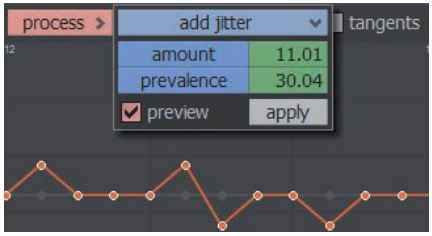


The *densify* function inserts nodes into the parameter curve at intervals determined by the numeric value entered in the *interval* box. This should be done before applying the *add noise* or *add jitter* functions.



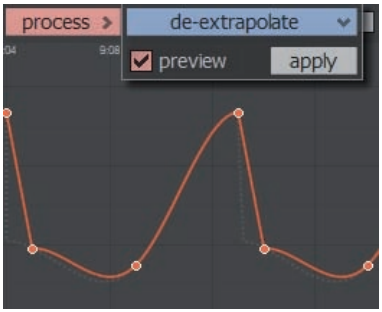
The *add noise* function creates random noise in the vertical axis determined by the numeric value entered in the *amount* box.



The *add jitter* function adds or subtracts a constant level in the vertical axis depending on the numeric value in the *amount* box. The *prevalence* value controls the random frequency of this amount.

The *quantise* function works from left to right and 'rounds' the position of the nodes to the *interval* amount giving the nearest fit for the keyframe graph.

The *slide* function allows you to numerically move or copy all nodes or a selection of nodes, with the option of also mirroring them.



The *de-extrapolate* function adds nodes where usually there are not any; for example at the beginning and end of a segment (there must be a minimum of one keyframe initially). This is also useful for adding keyframe nodes to the graphs created within the Keyframe Controller (see previous section).

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Using the Lock Function

The *lock* function in the top of the process menu area can be used to control which nodes on a parameter curve are affected by a change to the parameter:

a With the *lock* function disabled (ie the box is not ticked) any changes made to a value only affect the currently selected keyframe.

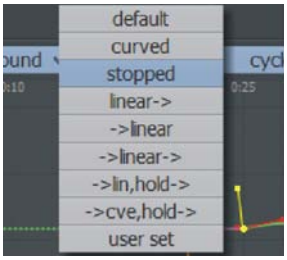
b With the *lock* function ticked any changes to a value affect all of the keyframes on the parameter curve.

c Dragging to the right on the *lock* box allows all keyframes after the currently selected node to be adjusted while leaving those before the selected node unaffected.

d Dragging to the left on the *lock* box allows all keyframes before the currently selected node to be adjusted while leaving those after the selected node unaffected.

e Dragging down on the *lock* box allows adjustment of only the nodes to the immediate left or right of the selected node.

Defining Keyframe Transitions



The change in parameter values between keyframes (ie the transition) can be controlled in a number of ways and can be set to suit the type of effect that is required.

The apparent movement of the transition into and out of each keyframe can be set as follows:

default	The rate of change adopted gives the best curve fit to move smoothly through the adjacent nodes.
curved	The rate of change slows down as it approaches the node and speeds up as it leaves the node.
stopped	The change stops as it reaches the node.
linear →	The rate of change remains constant out of the node.
→linear	The rate of change remains constant into the node.
→linear→	The rate of change remains constant into the node and out of the node.
→lin,hold→	The rate of change remains constant into the node and then stops until the next node.
→cve,hold→	The rate of change slows down as it approaches the node and then stops until the next node.
user set	The rate of change into and out of the node are set using the tangents on each node of the curve.

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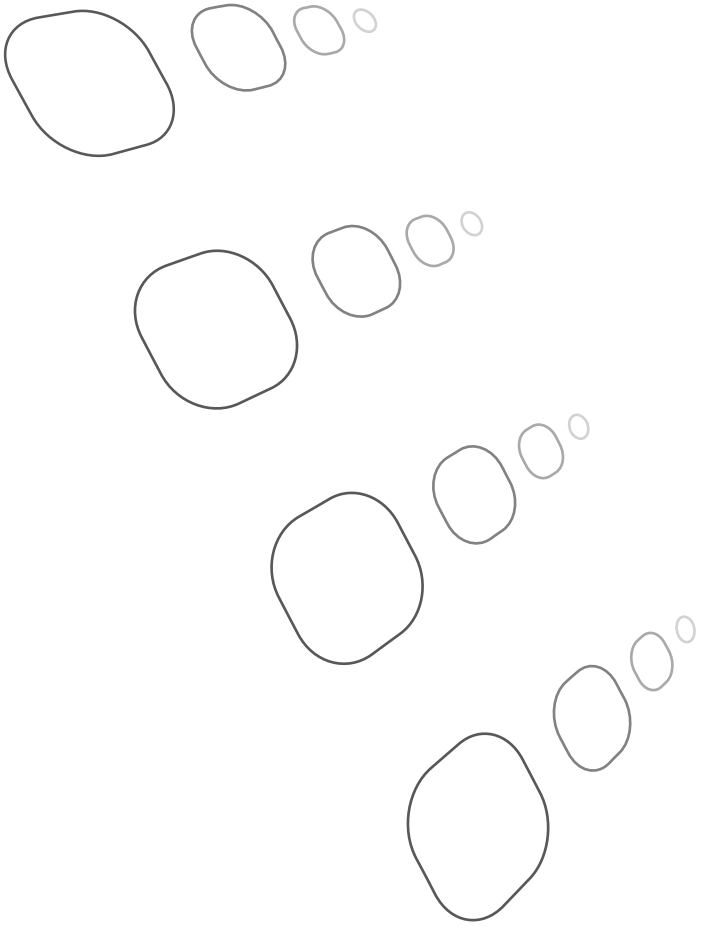


3

Process Types & Functions

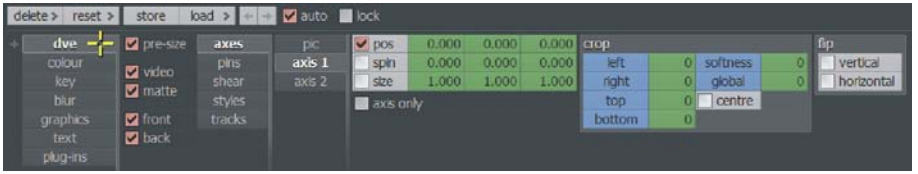
MLT processes include DVE, Key, Blur, Graphics, Text and Plug-ins.

See ‘Grading User Guide’ for Colour process details.

DVE Process

Axes Menu

When the *dve – axes* menu is selected, numerical control of *pos* (position), *spin* and *size* is provided by the green *x, y* and *z* boxes.



There are different numerical values for each of the 3 DVE axes; *pic* (picture), *axis 1* and *axis 2*. There are also a number of flat picture processes such as *crop*, *shear*, *pre-size*, *flip* and *centre* that can be applied to the actual image content.

If the *pre-size* box is ticked, the image is automatically re-sized to match that of the background video track or render format.

If the *video* box is ticked, the video channel for the currently selected video track is displayed.

If the *matte* box is ticked, the associated key or matte channel for the currently selected video track is displayed.

The *front* and *back* tick boxes determine whether the layer image is displayed on the front, back or both sides when applying a DVE change to the selected video.

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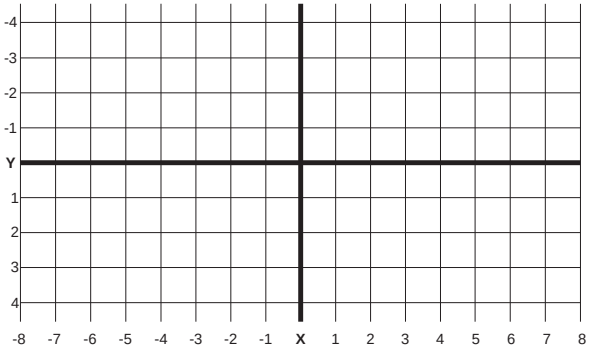
Position, Size & Spin in 3D Space

Each frame of any clip is saved as a flat 2D image then manipulated in 3D space before being projected back onto the 2D television screen. The frames are manipulated using 3D modelling equations controlled by the user entered values of X, Y and Z for position, size and spin.



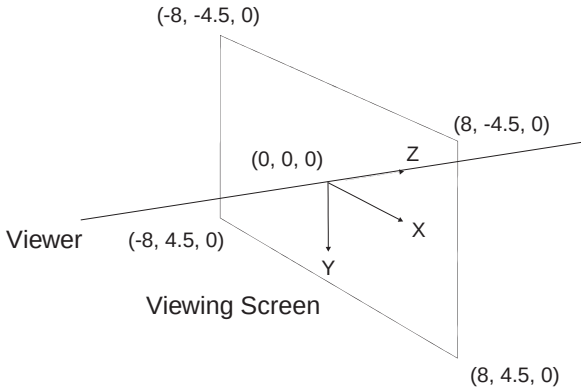
The position of any frame of 16 x 9 aspect ratio material is defined on the television screen by a 16 x 9 x 50 grid (corresponding to the X, Y and Z values) with a centre at 0X, 0Y and 0Z.

The values are calculated and entered in units and decimals of grid. Images can be placed off-screen using values outside those of the 16 x 9 grid of the screen.

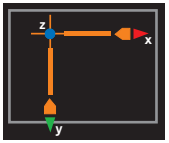
The 16 x 9 (or 16 x 12 for 4 x 3 aspect ratio material) grid is nominal for the television screen. The actual picture area is slightly larger than this grid and is shown by the default positions of the corner 'pin' arrows. This grid and the pin arrows can be used to accurately define the edges of the images.

The X, Y and Z coordinates can be entered either numerically, by the pen, by using the 3D cursors or by corner pinning.

3D Cursors – Pic, Axis 1 & 2



The 3D cursors are a useful aid to setting-up off-centre spins or more complex movements. They show where the control axes of the keyframe are located and can help to visualise the movements required for a specific effect.



Select *pic, axis 1* or *axis 2* followed by *pos* or *size*, then place the cursor over the image area to view the 3D cursors shown on the left (note that the cursors for *pic and axis 1* are orange; *axis 2* are green). The picture axis is suspended from axis 1; axis 1 is suspended from axis 2 and axis 2 is suspended from the centre of the screen.

Before a spin change has been applied, the X and Y cursors appear as shown in the first diagram below and the blue Z cursor does nothing. When a spin is applied, the Z cursor moves accordingly (see second diagram for an example):

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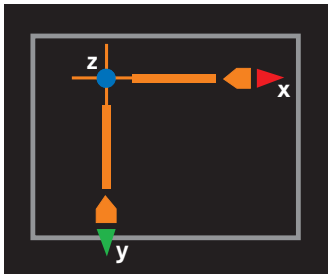
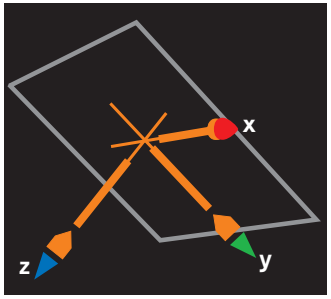




drag left/right to affect:

- **x *pos***
- **x *size*** *(left to decrease, right to increase)*
- **x *spin***

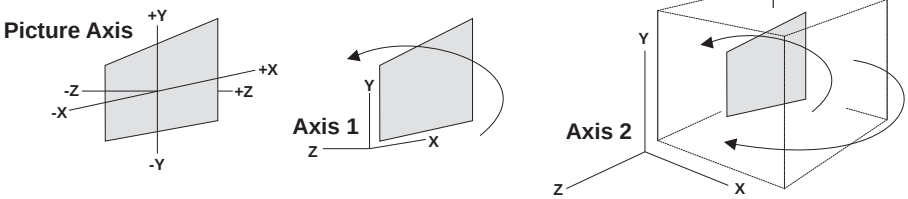
drag up/down to affect:

- **y *pos***
- **y *size*** *(up to decrease, down to increase)*
- **y *spin***

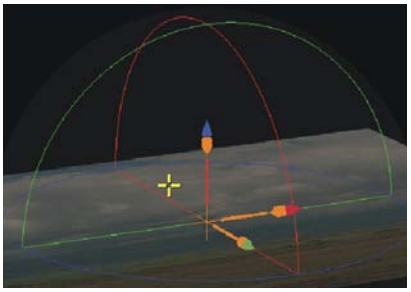
drag left/right/up/down to affect:

- **x & y *pos***
- **z *pos***
- **z *size***
- **z *spin***

After a spin has been applied, dragging an X, Y or Z control now affects all X, Y or Z values (as the image is no longer positioned exactly on a horizontal or vertical plane in 2D).



The picture axis is 'attached' to the centre of the image unless the *axis only* box is ticked (*axis only* allows you to move the cursor to an image edge, for example, then spin the image from this point on the edge). The three individual axes (X, Y, Z) of this control axis specify the positive X (red), Y (green) and Z (blue) directions of the picture and axis with respect to space defined by axis 1.



If you select *pic, axis 1* or *axis 2* followed by *spin*, the arc cursors on the left appear. You can press and drag on any of the arcs representing each axis.

The grey outline around the arcs can be dragged to rotate the image while maintaining the axes' relative position.

Crop Menu

The *crop* menu allows the edges of the image to be cropped:

left	the green numeric *left* box controls the amount of crop applied to the left edge of the image.
right	the green numeric *right* box controls the amount of crop applied to the right edge of the image.
top	the green numeric *top* box controls the amount of crop applied to the top edge of the image.
bottom	the green numeric *bottom* box controls the amount of crop applied to the bottom edge of the image.
softness	the green numeric *softness* box controls the softness applied to the cropped edges.
global	the green numeric *global* box allows a crop to be applied to all edges at the same time.
centre	the *centre* box re-centres a cropped image.

Flip Menu

The *vertical* and *horizontal* boxes flip (mirror) the image vertically or horizontally.

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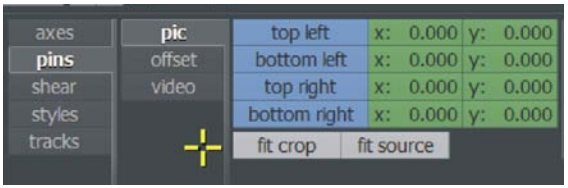
Pins Menu



The *dve – pins* menu allows the corners of an image to be repositioned anywhere in 3D space; the image is then automatically transformed to the new aspect.

If you hover the cursor over the image area, 4 blue pins appear in each corner of the image and 4 pins in the centre on each side. Press and drag any pin to a new position and the image updates accordingly.

The menu displays corresponding pairs of green numeric boxes for each of the corner pins (ie *top left*, *bottom left*, *top right*, *bottom right*). You can enter values here instead of dragging pins on the image.

The *pic* box allows the pins and image to be moved together.

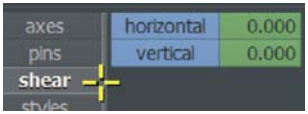
The *offset* box allows the pins to be moved without moving the image.

The *video* box allows the image to be moved without moving the pins.

The *fit crop* box fits the pins to the cropped image.

The *fit source* box fits the pins to the original image, even if it has been cropped.

Shear Menu



The green numeric boxes in the *dve – shear* menu allow the image to be skewed on the X and Y axis.

Styles Menu

When the *dve – styles* menu is selected, a choice of *frame, outline, emboss* and *shadow* is provided.

Where colour pots are displayed, press <F2> on the keyboard to toggle the Colour Palette on/off enabling you to mix and select colours then press on the pots to transfer them.

With *frame* (ie border) selected the following appears:

width	controls the width of the resultant frame.
colour	the pot determines the colour of the resultant frame.

With *outline* selected the following appears:

width	controls the width of the resultant outline.
softness	controls the softness of the resultant outline.
outline	the *colour* pot determines the colour of the resultant outline.
pic	when ticked, this displays the video within the outline.
colour	when ticked, this displays the area within the outline as a solid colour. The pot determines the colour.

With *emboss* selected the following appears:

depth	controls the depth of emboss on the image
direction	controls the direction of emboss
colour	the 2 pots determine the colour of the resultant embossed video.

With *shadow* selected the following appears:

softness	controls the softness of the resultant shadow.
strength	controls the brightness of the shadow colour.
colour	the pot determines the colour of the resultant shadow.
pos	determines the position of the resultant shadow with respect to the video position.

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spin determines the aspect of the resultant shadow with respect to that of the video.

size the green numeric boxes determine the size of the resultant shadow with respect to that of the video.

Key Process

The *key* process has several functions including:

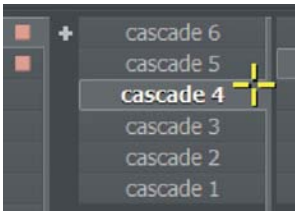
a cut-out or mask unwanted items using drawn graphic objects

b change colour of sampled colour ranges

c use text to cutout or colour an area

Cascade (Key Levels)

Press the '+' box to the left of *cascade 1* to create a new key-cascade level, then when you've finished the key, press '+' to commit this key and start a new key on *cascade 2*.



Keys can now be set-up on each cascade level. Successive levels are combined to produce a composite key. If you want to edit an existing cascade level, select it from the list (it highlights to indicate that it is current) then change the required key parameters.

You can rename the cascades by clicking on the cascade name you want to change, eg *cascade 4*, and entering a new name using the hard or soft keyboard.

Press *delete* followed by the required cascade box to delete the selected level.

See the Grading User Guide for more details of using Cascades and keys, and to selectively change colour.

High Contrast View (K)

Selecting the *K* box on the top-right of the menu area allows a hicon (high contrast) view of any type of key to be seen.

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Reversing/Inverting a Key

key reversed (eg desaturate other ranges except sky)

In any of the key menus you can tick *reverse* (or *invert*) to reverse the key created by the sampled colour or vector object. This 'masks' the sampled colour range or vector object from subsequent changes, eg desaturation, while other colours/ areas outside the key are affected.

Method Menu

The *key – method* menu allows you to choose a *chroma, chroma YUV, chroma HSL, linear* or *input* key from the blue scroll box on the right.

Chroma Key

With *chroma* selected, you can sample key colours based on the current image's YUV/RGB values:

1 Press the '+' box then press with the cursor or draw a lasso (box) on the image colour range you want to change (eg over an area of blue sky). For the initial selection try and include midtone ranges and not extreme highlights/shadows of the range. The sampled colour range automatically increases to add a small range of different luminance levels above and below the sampled colour and hues either side.

key colour sample range (eg blue sky)

graded key range (eg desaturate sky)

2 If required, use the '+' box to add more of the colour range to the initial sample; you may want to include more highlights or shadows. If you select too much, press the '-' box and draw a lasso over the unwanted range.

You can also adjust components by pressing values and entering numeric values in the low, high and soft boxes for each YUV component.

3 In the colour process, change the colour, which should affect only the sampled colour area, eg change the sky to grey by entering '0' in the *colour – primary – sat* box. Return to the key functions and if required, tick *reverse* to reverse the key created by the sampled colour (eg everything except the sky now turns grey).

4 There may be some spill around the edges of the sampled colour and inconsistencies in the density of the key produced. Press the '-' box then select ranges to be removed from the sample.

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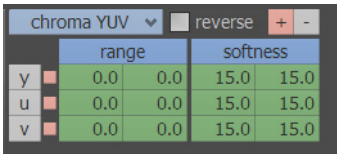
5 Change the *softness* value to soften the key edges if required.

6 If necessary, use the '+' and '–' boxes to accurately adjust the key range.

The keys from each sample combine to create the final key through which the colour correction is applied.

Sampling a very small area may produce poor results if the sampled colour is grainy or poorly lit. Alternatively, sampling large areas may select colours outside the required colour range. Try using different lasso sizes and sample different areas to include the whole luminance range of key colour.

Chroma YUV Key

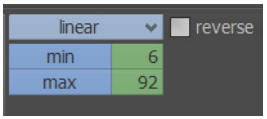


With *chroma YUV* selected, you can create a key from the specified range of Y luma, the specified range of U chrominance and the specified range of V chrominance:

Do this by drawing a lasso and pressing the '+' and '–' boxes (follow steps **2** – **7** in 'Chroma Key' previously in this section).

You can also adjust components by entering numeric values in the *y, u* and *v* left and right *range* boxes to specify minimum/maximum colour ranges. To soften each component, enter minimum/maximum values in the left/right *softness* boxes.

Linear Key



With *linear* selected, you can create a key by selecting a key threshold range on the image:

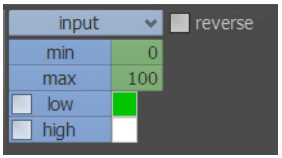
1 Drag a lasso over the key colour you require on the image. You can now adjust the following to eliminate spill and inconsistencies:

min controls the low threshold of the key; image information below this threshold is ignored.

max controls the high threshold of the key; image information between the *min* and *max* level is the key area.

It may be useful to start with a *min* value of 20 and a *max* value of 80, then make small increments until you achieve the required result. The input key inverts if the *max* value is less than the *min* value.

Input Key



With *input* selected, you can specify the threshold range of the key so that the best area of a sloped edge input key can be selected.

Select the required low and high key colours on the image as follows:

low tick this box then select a 'low 'colour reference from the image; this appears in the corresponding swatch pot.

high tick this box then select a 'high' colour reference from the image; this appears in the corresponding swatch pot.

Adjust each colour by changing the *min* and *max* numeric values:

min controls the low threshold of the key; image information below this threshold is ignored.

max controls the high threshold of the key; image information between the *min* and *max* level is the key area.

The input key inverts if the *max* value is less than the *min* value.

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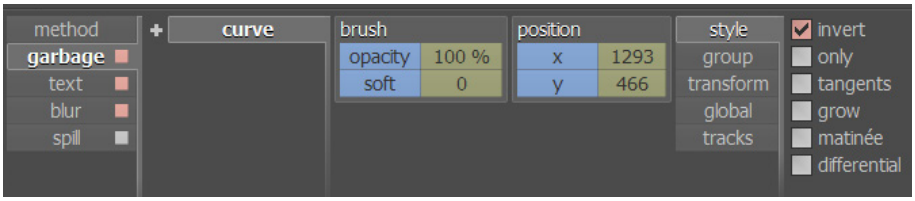
Garbage Menu



The *key – garbage* menu allows drawn graphic objects to cut-out or mask unwanted items on foreground key layers (eg microphones, tracking markers, people, bags, etc).

The functions available in this menu are detailed in the 'Graphics Process' section.

See 'Graphics Process' later in this user guide for full details.

The *many* tick box allows you to draw the same type of graphic object (eg a square) multiple times without repeatedly selecting this from the menu.

The *brush* menu allows you to set the opacity of the shape over the image area and also the softness on the edges of the shape (ie it feathers the edges).

The *position/size* menu allows you to reposition and size the object numerically.

The menu on the right allows you to manipulate basic graphic objects into more complex shapes by combining or connecting them:

only Prevents other shapes being selected by mistake if they overlap each other.

grow Tick this and enter a value in the numeric box to shrink/grow the edges of the overall key (positive values grow the edges; negative values shrink the edges).

tangents Tick this to display tangents on the connected line/curve that emanate from each node point (when you hover the cursor over the shape). Drag the handle on the end of a tangent to modify the curve. A brown tangent affects the curve entering and exiting the node; a magenta tangent affects the curve entering the node; a red tangent affects the curve exiting the node.

differential Only appears with Stereo3D media; see 'Stereo3D User Guide' for more information.

matinée The *matinée* function allows the edge of the key shape to be feathered (softened) and the level of feather adjusted on specific areas.

Draw a key shape then tick *matinée*. A matinée outline now appears over the existing shape outline. Depending on the shape, either enter a positive/negative value in the single numeric box (to grow/shrink the shape), or vertical and horizontal grow/shrink values in the two boxes. Keep the cursor positioned over the image area to provide a wireframe display of the two outlines.

Increase or decrease specific areas of the matinée effect by selecting a single node or lassoing multiple nodes on the matinée outline then dragging to a new position. This changes the level of feather between the shape and the matinée outlines. You can also modify the matinée curve using the *transform – curve properties* floating menu functions (see 'Converting to Curves & Curve Properties' later in this section).

If you modify the original shape outline, the matinée curve moves with it. If you modify the matinée curve, the original shape outline does not move.

With *line* or *curve* selected, a *tracks* box appears in the menu stack. This allows you to use a tracking path with multiple points on it (unlimited points for a curve and 2 points for a line) that has been created in the *Tracker* menu.

See 'Tracker Function' in chapter 4 for more details.

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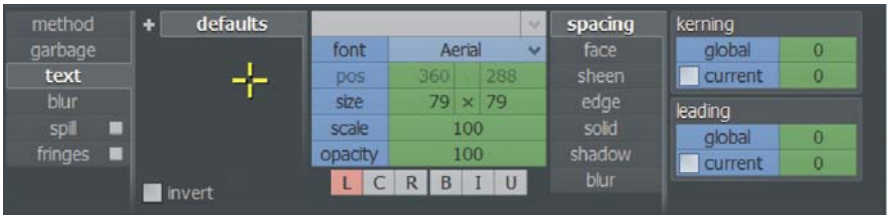
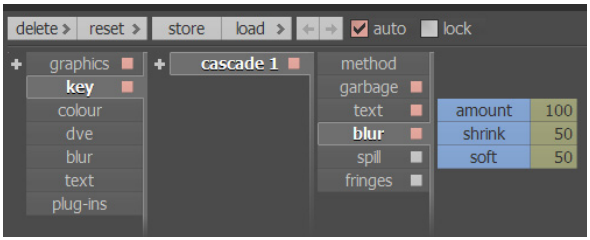
Text Menu



The *key – text* menu allows text to be used as a key/cutout to expose video from underlying video tracks.

See 'Text Process' later in this user guide for full details.

Blur Menu



To blur any key type, press the *blur* box and adjust the numerical values in the in the *amount* numeric box to change the depth of blur.

Change the *shrink* value to grow or shrink the edges of the overall key (positive values grow the edges; negative values shrink the edges). Soften the edges of the key by changing the *soft* value.

See 'Blur Process' later in this user guide for full details of blurring clips.

Spill Menu

'Spill' is where the key colour has contaminated the required foreground elements.

The effects of colour spill can be neutralised from the *key –spill menu.*

The spill colour can be replaced by colour matching the rest of the foreground element.

The *key – spill* menu allows almost all of the key colour spill to be replaced by a neutral colour.

The colour pot transfers the colour from the original key that was pulled from the scroll box, eg *chroma*.

You can adjust the value of the spill replacement colour; the *R gain*, *G gain* and *B gain* boxes allow the replacement colour to be defined using numeric values.

The values next to the two colour graduated boxes determine the amount of key colour spill to remove (in the spill area) from the primary colours in the foreground image. The *range* values determine the range of colour shades next to the chosen key colour that are also considered as spill.

The *Y restore* and *Y boost* boxes allow the key edge slope to be adjusted to improve the definition of the spill component.

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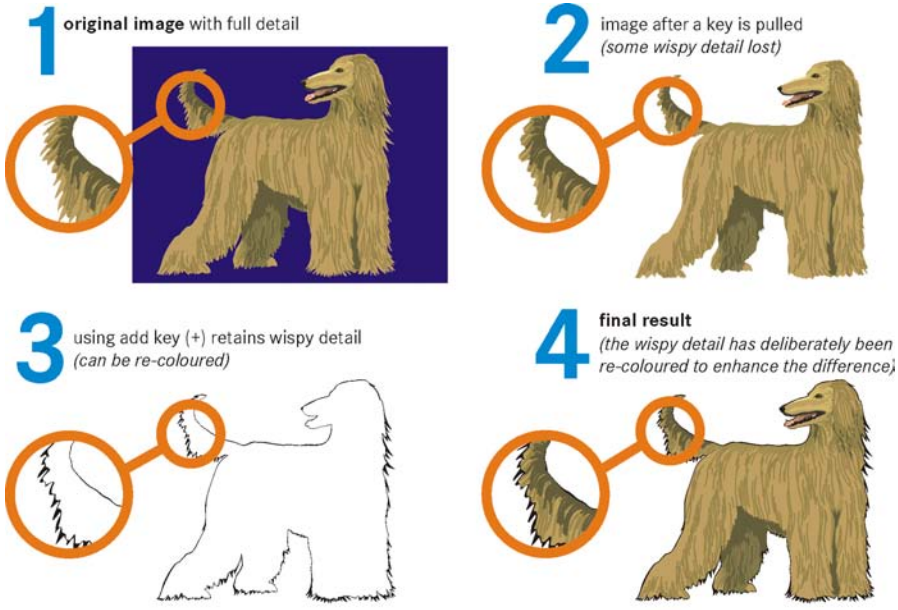
Fringes Menu

The *key – fringes* menu allows any fine detail lost due to the basic key process (for example wispy hair that had key colour spill on it) to be displayed as a neutral grey edge around the key.

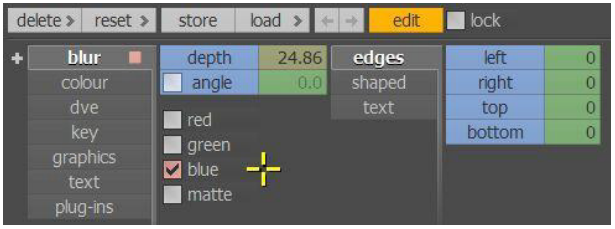
Select the *fringes* box and re-colour the fine details re-introduced by the add key (+) function to match the foreground, eg matching the hair colour to the foreground.



note that for clarity, there is no background in this example

The *R gain*, *G gain* and *B gain* boxes allow the replacement colour to be defined using red, green and blue values. The *contrast* and *saturation* boxes allow the contrast and saturation of the replacement colour to be changed to match the foreground.

Blur Process



The *blur* menu allows a directional blur to be applied to each clip segment or video track.

The value in the green *depth* box controls the amount of blur to be applied to the selected clip segment or video track.

The value in the green *angle* box determines the angle of blur to be applied.

When you have a RBG clip or segment loaded on the timeline, you can select luma channels using the tick boxes (*red*, *green*, or *blue*) to apply the blur process to individual luma channels.

When you have a YUV clip or segment, you can select *video* or *matte* to apply the blur to these components only.

Edges Menu

The *blur – edges* menu displays *top*, *bottom*, *left* and *right* numeric values that determine how far away from the edge of the image blur occurs and can be adjusted to remove artefacts that may occur with large amounts of directional blur.

Shaped Menu

The *blur –shaped* menu allows the image to be blurred through a graphic shape or through a group of combined graphic shapes; the functions available in this menu are detailed in the 'Graphics Process' section.

See 'Graphics Process' later in this user guide for full details.

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Text Menu

The *blur – text* menu allows the image to be blurred through a text shaped cut-out; the functions available in this menu are detailed in the Text Process menu.

See 'Text Process' later in this user guide for full details.

Graphics Process

The *graphics* process provides drawing tools for creating vector shapes (ie lines, rectangles, circles etc) that can be modified and keyframed in order to create dynamic (changing) shapes over the video tracks below.

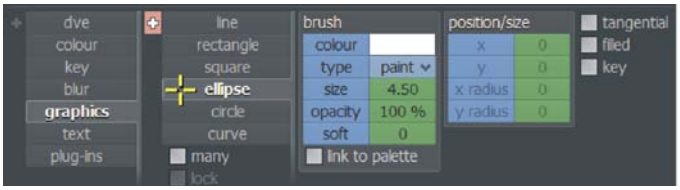
By default, graphic objects are drawn on the currently selected video track and when this video track is rendered the graphic objects are 'burnt' into the video. The *key* process (previously described) can be used to 'cut a hole' through the video track with the shape of the graphic objects and each object can add or remove areas to make complex keys.

If graphic objects are added to an empty video track or an empty segment of a video track, a clip segment is created for the graphics. This clip segment can be extended and have transitions such as dissolves and wipes applied.

Creating & Naming Shapes

1. Select the video track and position that you want the graphic placed over.

2. Select the shape you want to draw from the list, eg *ellipse*. The *ellipse* sub-menu now appears to the right (see screen shot below). Note that these menu functions differ depending which shape you select.



3. Draw on the image area by pressing the cursor to fix the first point of the object then move the cursor and press again to finish drawing.

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4 When an object has been drawn, in this example an ellipse, it is automatically assigned the name *ellipse* displayed in the first column, and individual parameters appear for it on the right (see screen shot below); these are described later in this section.

5 You can overwrite this name by clicking on the name and entering a new one in the soft keyboard pop-up.

6 If you want to draw another shape, press the + box on the left which toggles between the generic and individual (already created) shape stack. Select a generic shape, draw it and the individual shape stack now updates to include the new shape. The screen shot above shows 3 ellipses in the stack. The orginal is named *ellipse*, whereas each subsequent ellipse is automatically incremented, eg *ellipse 2, ellipse 3* etc and is placed above the previous one. Rename the shapes if required (see step 4).

Modifying a Shape

Modify each shape by pressing the + box on the left to toggle the individual shape stack on. Select the shape you want to change, eg *ellipse 3*, then modify the shape itself on screen (described later) or change the individual parameters on the right, eg *colour* and *opacity*.

You can change a line or curve by dragging the nodes along it and either end of it to a new position. You can also do this on a shape, eg circle, but you must press *transform – to curve* first.

Re-ordering Shapes

Any process menu that provides shapes (eg *graphics, blur, colour, key*) allows you to pull forward or push back shapes by dragging the shape name box up or down the stack (eg you can drag *ellipse 2* and drop it above *ellipse 3*). The shape

at the top of the list is placed in front of other shapes and the shape at the bottom is behind the others.

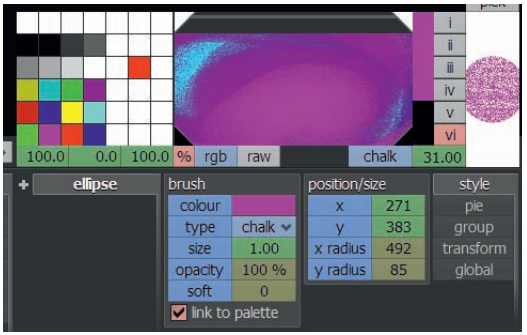
Pressing the + box toggles between the generic and individual (already created) shape stack.

Deleting Shapes

Selecting the *reset* box followed by the *graphics* or shape name box resets the values back to their default, but leaves any keyframes in place. Selecting the *delete* box followed by the *graphics* or shape name box deletes all parameters for the currently selected clip segment or video track.

Brush Menu

In the *brush* menu, you can set outline options for each graphic shape. Most values in this menu can be keyframed except brush type.



To set the brush colour:

1. Open the colour palette by pressing <F2>
2. Press on a colour in the colour palette.
3. Press on the box to the right of *colour* in the *brush* menu.

This updates the colour of the brush to the colour selected in the colour palette. Use the *type* scroll box displaying *paint, air* (airbrush), *chalk* or *chair* (chalk+airbrush) to select the brush for the current shape.

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Adjust *size*, *opacity* and *soft* by changing the values in the corresponding green boxes:

size	Determines the brush size.
opacity	Determines the brush transparency. A value of 100% is fully opaque and a value of 0% is fully transparent.
soft	Determines how soft/blurred the brush edges appear. A value of 0% indicates no blurring.

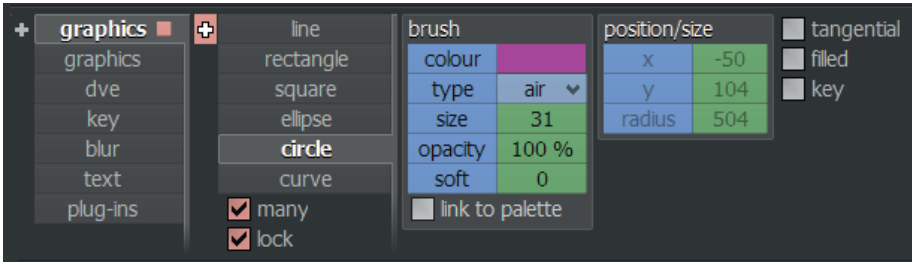
Brush options are applied to the currently selected shape and to any subsequently drawn shape.

Linking the Palette to the Brush Menu

You can link the *brush* menu to the colour palette so that any changes made in the palette are reflected in the *brush* menu. To link the palette tick *link to palette* in the *brush* menu. Brush options are applied to the currently selected shape and to any subsequently drawn shape. To break the link, simply deselect the *link to palette* tick box.

When the colour palette is linked, changing the values in the *brush* menu automatically updates the palette.

Many & Lock Functions

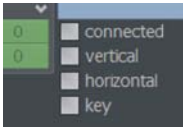


many — The *many* box allows multiple shapes of the same type (eg *square*) to be drawn anywhere on the image area. These shapes increment in the stack list, eg *square 2, square 3* etc. It also allows parallel lines to be drawn (with *line* plus *horizontal* or *vertical* ticked).

lock — The *lock* box can only be selected in conjunction with *many*; it allows shapes to be drawn inside/outside each other from one reference point, plus concentric shapes to be created (ie with the reference point in the centre of the shape). The first cursor press becomes the 'locked' start point for subsequent shapes. To finish drawing the 'locked' shapes, right-click with the cursor.

Some examples of shapes drawn with *many* and *lock* selected are shown in the following pages.

Style Menu



Before drawing a shape on the image area, you can choose styles for it by ticking the required boxes near the centre of the menu area. The options available before drawing include those in the *style* menu which then displays more options after you've drawn the shape.

Options available depend on the shape you've selected from the list; these specific options are described in the 'shape' sections that follow in this chapter (eg 'Lines & Curves').

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General Shapes

The following options can be applied to various shape types:

key — makes a key from the shape so that it cuts through the video layer; you can also select *invert* to invert the key or *union* to form a key from a combination of shapes (see 'Key Shapes' at the end of the 'Graphics' section).

only — appears in the menu only after a shape is drawn and prevents other shapes being selected by mistake if they overlay each other.

Lines & Curves

The following options appear in either the *line* or *curve* menus before or after drawing. You can modify a curve or line by dragging the nodes on the shape itself or the tangent handles:

use track — with *line* or *curve* selected, a blue *use track* box appears. This allows you to use a tracking path with multiple points on it (unlimited points for a curve and 2 points for a line) that has been created in the *Tracker* menu. See 'Tracker Function' in chapter 4 for more details.

connected — joins subsequent lines together.

vertical — snaps the subsequent line to the vertical axis.

horizontal — snaps the subsequent line to the horizontal axis.

straight — draws a 'curve' as a straight line.

closed — the first and last node snap together to form a closed shape.

filled — fills the curve with the current colour.

h zip — restores clips with a horizontal scratch running through the image, or is used to remove wires or other unwanted items. Zip uses the data either side of the cursor position to close the defective area as you drag the cursor left/right. Use the *zoom* mode for accuracy.

v zip — as above, except that you use this for vertical defects and drag the cursor up/down.

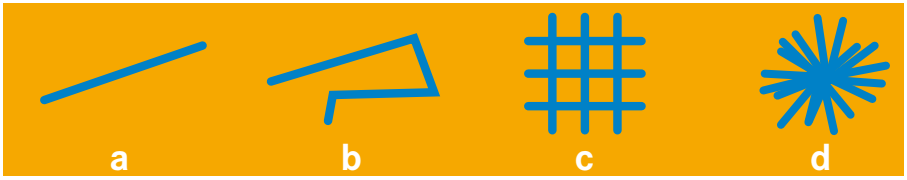
tangents — when a connected line or a curve is drawn, *tangents* displays handles on each node which allows you to modify the curve

shape easily. Dragging any node affects the position of the node. Dragging the ends of the handles affects the angle/smoothness of the line emanating from the node.

curve — when a line or curve is drawn (or a shape is converted 'to curve')

properties — the *curve properties* floating menu appears; this is described later in the 'Transform Menu' section.

Examples (*line*)



The examples above use the following *line* menu options:

a with *line* selected, individual lines can be drawn by clicking on the image where you want the start of the line to be, then moving the pen and clicking again to finish the line.

b select *connected* before drawing to join subsequent lines together. You should now click on the image position where you want to start the line, then click wherever you want to change the line direction and right-click (or press and lift the pen away from the tablet) to finish the line.

c with *many* and *vertical* selected and the grid enabled (select *grid* then *x snap* and *y snap*), you can draw evenly spaced parallel lines. Now select *horizontal* and draw across the vertical lines.

d with *many* and *lock* ticked, the first cursor press is used as a reference start point for all subsequent lines. This can be used to produce lines radiating from a central point. Right-click or lift the pen away to finish drawing.

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Examples (*curve*)

The examples above use the following *curve* menu options:

a with *curve* selected, a curve can be drawn by left clicking where you want to start, then clicking when you want to change direction. Right-click or lift the pen away to finish drawing.

b with *closed* selected, you can draw a closed curve. Click when you want to change direction then right-click or lift the pen away to finish drawing.

c the same options as **b**, but with *filled* also selected.

d with *many* selected and the grid enabled (select *grid* then *x snap* and *y snap*), you can draw evenly spaced curves by clicking on each grid marker then right-clicking to finish drawing each curve.

Note that straight lines can also be drawn with *curve* – *straight* selected.

Rectangles & Squares

The following options appear in either the *rectangle* or *square* menus before or after drawing:

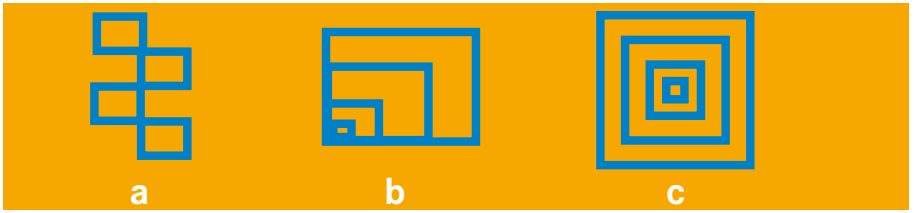
centred — the cursor starting point now represents the centre of the rectangle instead of the corner. See following examples.

gradient — this provides 4 pots into which you can deposit up to 4 colours from the palette. The shape now fills with graduated colours from each corner. Use only 2 or 3 colours in the 4 pots to create a simpler graduation.

filled — fills the shape with the current menu colour.

solid fills the shape solidly with the current menu colour (brush type is retained with the shape, but not displayed unless you toggle *solid* off).

Examples



The examples above use the following menu options:

a with *rectangle* and *many* selected and the grid enabled (select *grid* then *x snap* and *y snap*), you can draw aligned shapes by clicking on each grid marker then clicking on the marker you want to finish the shape on.

b with *many* and *lock* selected, the *rectangle* function is used to draw the original shape from the bottom-left (ie the reference point) to the top-right corner. Subsequent rectangles 'lock' to the bottom-left point.

c with *many, lock* and *centred* ticked, the *square* function is used to create concentric squares (you can also use *rectangle*). If you want even spacing between concentric shapes, select *grid* then *x snap* and *y snap*.

Ellipses & Circles

The following options appear in either the *circle* or *ellipse* menus before or after drawing:

tangential the first cursor press fixes the start of the circle/ellipse and the second cursor press defines both the size and the angle of ellipse (with *tangential* off, an ellipse will be aligned to a horizontal or vertical axis). See following examples.

filled fills the shape with the current menu colour.

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Examples

The examples above use the following menu options:

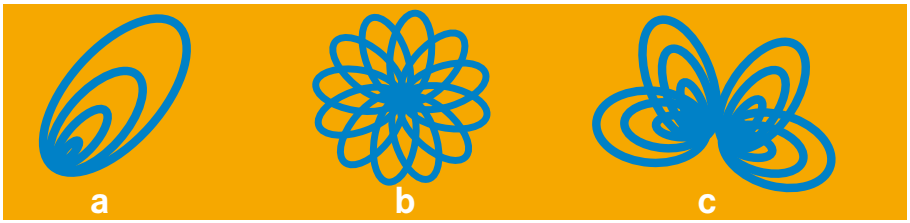
a with *circle* and *many* selected and the grid enabled (select *grid* then *x snap* and *y snap*), you can draw aligned shapes by clicking on each grid marker then clicking on the marker you want to finish the shape on.

b with *many, lock* and *tangential* selected, the *circle* function can be used to click then draw upwards which locks the first cursor click as the reference point for subsequent shapes. Right-click or lift the pen away to finish drawing.

c with *many* and *lock* selected, the *circle* function is used to create concentric circles. If you want even spacing between concentric shapes, select *grid* then *x snap* and *y snap*.

d with *many* and *lock* selected, the *ellipse* function can be used to create concentric horizontal or vertical ellipses (the latter being the example above). If you want even spacing, select *grid* then *x snap* and *y snap*.

Examples



The examples above use the following menu options:

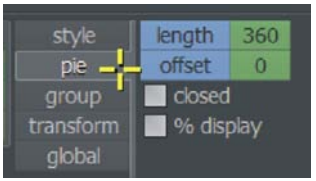
a with *many, lock* and *tangential* selected, the *ellipse* function can be used to click then draw out at an angle which locks the first cursor click as the

reference point for subsequent shapes. Right-click (or lift the pen away from the tablet) to finish drawing.

b The same options as **a**, but instead draw out at different angles to rotate subsequent shapes around a central point (ie the first cursor press).

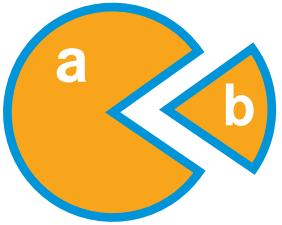
c The same options as **a**, but instead right click to finish the first 'set' of ellipses then move to a different point and draw the next set.

Pie Menu



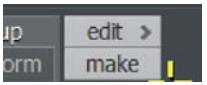
Circles and ellipses can be converted to a pie 'slice' by selecting the *pie* menu that appears after a shape is drawn.

The *length* value determines how much of the pie is displayed. By default it displays in degrees, but you can tick *% display* to view the length as a percentage.



The *offset* value determines where on the pie the gap is. The *closed* box closes the gap in the circle with either an indent (see diagram **a**) or a slice (see diagram **b**); this depends on the *length* value previously set.

Group Menu



From the *group* menu, shapes can be grouped together by selecting them with a lasso (the shape names highlight to indicate those selected) and then pressing the *make* box.

The group can then be repositioned and resized as a single object. Each group is automatically given an incremental name (eg *group, group 2, group 3* etc) that can be changed by double-clicking on the name and entering a new one in the soft keyboard pop-up.

The currently selected group can be split back into individual shapes by pressing the *split* box. The shape list now updates accordingly. A group can have shapes removed from it by selecting *edit* and pressing on the shape to be removed from

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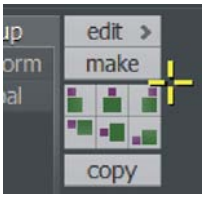
the group. Likewise additional objects can be added to the group by pressing on them.

Note that grouped objects cannot be filled, re-coloured, blurred or have brushes changed.

Aligning Shapes



If you drag a lasso around multiple shapes with the *group* menu selected, the *align* menu on the left appears.

align left edges

align top edges

align vertical centre

align horizontal centre

align right edges

align bottom edges

Pressing one of these options aligns the selected shapes accordingly.

Copying Shapes

The *group* menu's *copy* box copies and pastes the selected shapes over the existing shapes. The new incremented names are added to the stack on the left.

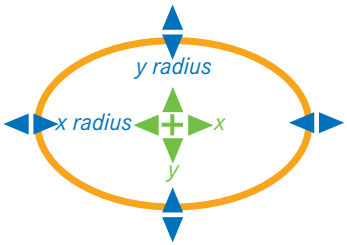
Positioning & Sizing Shapes

In most shape sub-menus (except the *transform* menu), you can re-position a shape manually on the image area by dragging it from its central axis point (indicated by the '+' cursor) to a new position. Similarly, you can re-size a shape by dragging its side, edge or corner point to the required size.

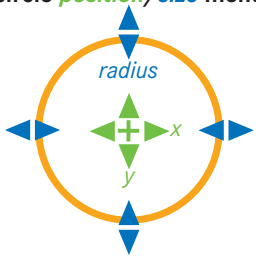
Position, Size, Corners, End Points Menu

As well as manually re-sizing or positioning a shape, you can also use the *position/size* menu to enter numeric values. The options available depend on the shape. For rectangles and squares, the *corner* menu can also be toggled on by pressing the *position* menu's '*v*' arrow on the right and if a single line is drawn an *end points* menu becomes available by pressing the '*v*' arrow.

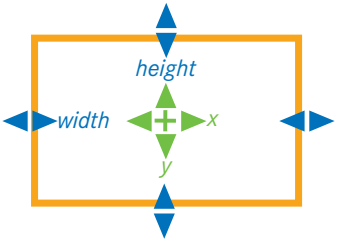
ellipse *position*/*size* menu



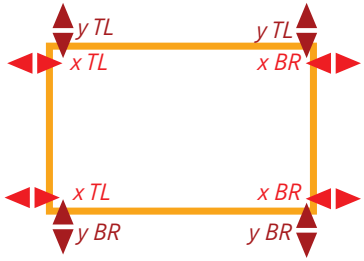
circle *position*/*size* menu



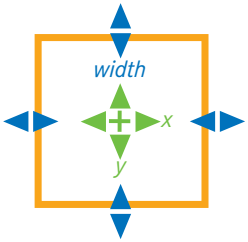
rectangle *position*/*size* menu



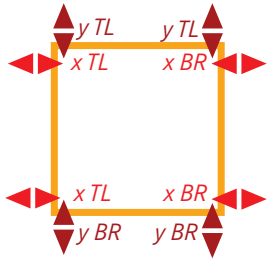
rectangle *corners* menu



square *position*/*size* menu

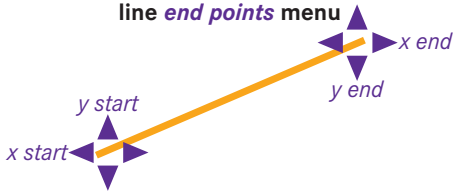


square *corners* menu



line/curve *position* menu

line *end points* menu



See above diagram for all position, size, corner and end point menu options.

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Transform Menu

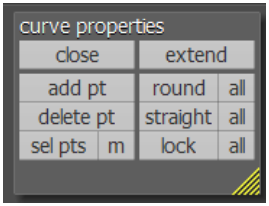
The *transform* menu provides the following options. When this menu is active, you can manually re-position a shape by dragging on an area inside the shape:

x/y axis	dragging the shape's '+' cursor or changing the values in the *x axis* and/or *y axis* boxes allow the shape's axis to be moved independently of the shape. For example, this allows the shape to be rotated around its corner instead of its centre.
angle	rotates the shape around the x and y axis points; these points can be inside or outside of the shape.
scale	scales the shape in relation to the x and y axis points.
mirror	mirrors (reflects) the shape horizontally in relation to the x axis point.
tumble	mirrors (reflects) the shape vertically in relation to the y axis point.
to curve	see following section for details.

Converting to Curves & Curve Properties

If you select *transform – to curve,* a basic shape such as a rectangle or circle is converted into a curve, indicated by the prefix 'cv' in the name field (eg *cv.rectangle*). For example, a circle or ellipse converted into a curve displays four nodes instead of one.

You can then modify the basic shape by moving the extra nodes/tangents that appear and add more nodes, resulting in a more complex shape. Tick *tangents* to see and modify the nodes.



The *transform – curve properties* floating menu appears when a curve or connected line is drawn or a shape has been converted to curves.

Move this menu if required by pressing on an empty area of the menu and dragging it to the required position. Left-click on the yellow triangle on the

bottom-right to return it to the default position; right-click to toggle between current/default positions.

The *curve properties* menu provides the following functions:

close	Closes the current open curve.
add pt/	Press *add pt* then press on the curve to add a new point (node) at this position.
delete pt	Press *delete pt* then press on the curve to delete this point. The curve automatically rejoins and adopts the properties of the nodes either side of the deleted one.
sel pts/ edit sel	Press *sel pts* (select points) then draw a lasso around nodes to select them. The selected nodes can then be moved together, locked, set to *straight* or set to *round*. The *edit sel* (edit selection) box then appears to allow individual nodes in the current selection to be deselected or additional ones to be added.
(m)	This only appears (next to *sel pts*) if *matinée* has been applied; it selects all the nodes on the matinée curve so that this can be moved/edited independently of the original outline. See 'Key – Garbage Menu' previously in this chapter for more details.
extend	Allows new nodes to be added to the 'finish' point of an existing curve or shape. Click where you want to place the new nodes.
round/all	If the *round* box is enabled after a connected line has been drawn (ie with straight lines between each node) you can then press on any node and the line in and out of this node becomes curved. If *all* is selected, all the points on the current curve are set to round.
straight/all	If the *straight* box is enabled after a curve has been drawn (ie with curved lines between each node) you can then press on any node and the line in and out of this node becomes straight. If *all* is selected, all the points on the current curve are set to straight.
lock/all	If the *lock* box is enabled after a curve or shape has been drawn, you can then press on any node and it will become fixed in its current position. If *all* is selected, all nodes on the current curve are fixed in their current positions.

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Note that a basic shape (eg circle) cannot be converted back into its original form after it has been converted to curves.

Tick Shapes Preview in the <F1> Configuration Window's UI menu to see a wireframe preview of the shape as you drag it over the image area.

Global Menu

Softness/Blur

If you select the *global* menu, a *softness* value can be entered. This softens/blurs all shapes at the same time, with higher values making the shapes more blurred than lower values.

Saving & Re-using Shapes

Settings Bin – Graphics

Graphic shapes (with or without a key) can be saved in the Settings Bin and then dragged into the image area in the *graphics, blur, colour* or *key* menus. Saved shapes in the Settings Bin are categorised *Graphics* in the blue scroll box at the bottom of the bin. The *selection* box at the bottom of the bin can be used as follows before pressing *save* and entering a name in the pop-up:

selection **OFF**	all the shapes on the current layer are saved. If previously saved shapes are dropped back into the *graphics* image area, any currently displayed shapes are deleted and replaced with those in the Settings Bin.
selection **ON**	only the currently selected shapes (ie a temporary group created with a lasso) are saved. If previously saved shapes are dropped back into the *graphics* image area, those in the Settings Bin are placed over any existing shapes.

Settings Bin shapes appear in the image area on the currently selected layer as a video object (with a key channel if one was saved with it – see next section).

Key Shapes

You can make a key from a shape by ticking *key* in the *graphics* menu.

If a Settings Bin key shape is dragged into the image area in either the *colour* or *blur* menus, the video channel from the shape is used as well as the key channel which enables the *shaped* function. In the *shaped* menu, press *convert shapes* to add the shapes individually to the stack.

If a Settings Bin key shape is dragged into the image area in the *key* menu, the *garbage* function enables; press *convert shapes* to add the shapes individually to the stack.

When you tick the *key* box in the *graphics* menu, you can also select *invert* to invert/reverse the key area or *union* to form a key from a combination of shapes.

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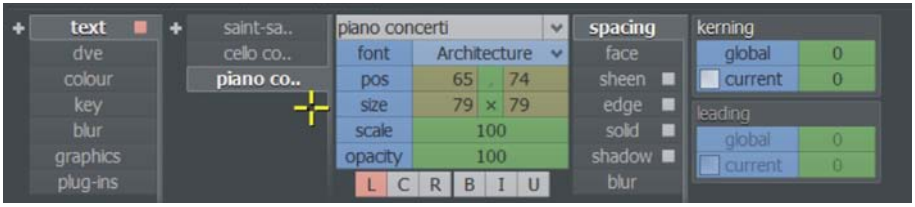
Text Process

Text can be applied to a video track (with or without video) where it has both a video and key component. The size, position and colour of the text can be keyframed.



If text is applied to an empty video track or an empty segment of a video track, a clip segment is created to hold the text. This clip segment can be extended and have transitions applied (eg dissolves and wipes).

Loading Fonts

Windows Fonts

The fonts used by the Quantel kernel are True Type and are installed in the C:\Windows\Fonts folder. These fonts are then displayed in the Quantel Fonts Bin on the Application Bar.

Fonts Bin

Fonts can be loaded into the *text* process' scroll list by opening the Fonts Bin from the Application Bar, then selecting and dragging them from the bin and dropping them on the scroll box. Up to 20 fonts can be held in this list.

A browse display of each font can be selected in the Fonts Bin. The yellow symbol in the top left corner of the open bin toggles between titles and browse display.

See 'Workstation & Seat Setup & Admin Guide' for how to install Windows fonts.

Users are responsible for ensuring that they have the appropriate rights to install and use specific typefaces and fonts.

Creating Text

1 Select the *text* process from the left of the menu area followed by the video track and position that you want the text placed over.

2 Select the font that you want to use from the *font* scroll box.

3 Press the'+' box ('add new text') to add text.

4 On the image area, press where you want to start the text. A box appears; this is the 'container' for the text and it resizes as text is entered.

5 Now enter the text. You can create a single character, word, line or multiple lines. See 'Adding New Text Lines & Boxes' further in this section for more details.

The text name (in the stack to the right of the '+' box) and the text entry field next to this update as you type; you can also enter text using this entry field.

Editing Text

Selecting Fonts & Text Boxes

You can select the font that you want to use from the *font* scroll box.

After a number of text objects have been created, you can select one by pressing the required name in the stack next to the '+' box. Alternatively, you can press on the text on the image area to select it; the stack name box highlights accordingly.

You can change the font, re-size or re-position the text and add colour styles to it using the settings in the *text* menu.

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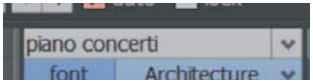
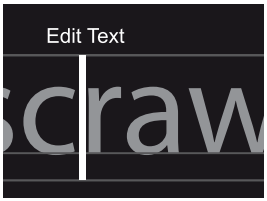
Selecting Characters & Words



You can select characters and words in the current text box by clicking in the text entry field (shown on the left) then dragging over the characters you want to change.

A highlight now appears in the text entry field and the image area. You can now re-type, style or delete this highlighted text while leaving the remaining text in the box unaffected.

Adding Characters



The 'I' cursor appears when you click between text two characters on the image area. You can use this cursor as a point to then type more characters which will be inserted at this position. You can also do this by clicking in the text entry field in the menu area then typing.

Adding New Text Lines & Boxes

Press <Return> to create a new line within the same text box. Press <Ctrl> + <Return> to create a new independent text box under the original (the stack on the left of the menu area updates accordingly).

Deleting Text Boxes & Characters

To delete a text object (ie contained in a box), select the text on the image area or select it in the name stack. Now press *delete* in the top-left of the menu area.

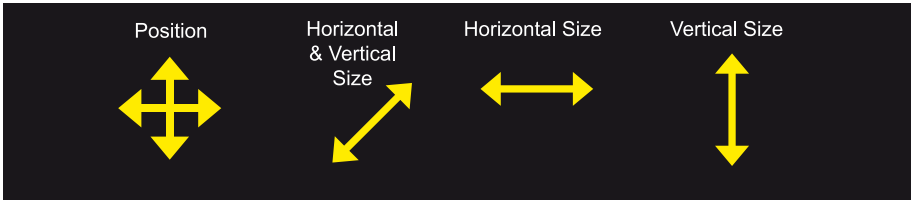
The 'I' cursor appears when you click inbetween text characters on the image area. You can now press <Delete> on the keyboard to delete the character to the right. Press <Backspace> to delete the character on the left.

Saving Text

Text objects with parameters can be saved in the Settings Bin with the category *Text* and then reused as required.

Positioning & Sizing Text

You can position or size text manually by hovering one of the yellow cursors over the text box then dragging. The cursor that appears depends on where you hover over the text box. These cursors provide the following functionality:



Alternatively, you can use the following menu options to position or size text:

pos — the two green *pos* boxes control the horizontal and vertical position of the current text object in the image area.

size — the two green *size* boxes control the character width and height of the current text object in the image area.

scale — the *scale* box determines the X and Y scale based on a percentage of the character size value.

Text Opacity

opacity — this affects the transparency of the text colour (0 is transparent).

Alignment

L, C, R Boxes

The *L*, *C* and *R* boxes control the horizontal alignment of text (left, centre and right). Note that you can also use the *grid* function to align text.

Font Style

B, I, U Boxes

Select the B box to make the current text **bold**.

Select the I box to make the current text *italic*.

Select the U box to make the current text underlined.

You can select one or a combination of the above if required.

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Spacing Menu

Kerning & Leading

The *kerning* menu affects horizontal spacing between characters:

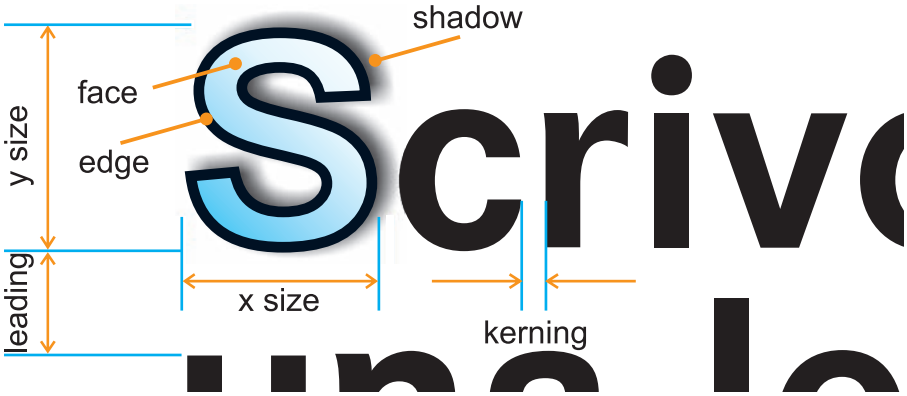
the value in the green *global* box affects the kerning between all characters in the current text box.

the value in the green *current* box affects the kerning of the currently selected character (ie at the cursor position). Ticking the box allows you to manually drag the space using the 'I' cursor in the text box.

The *leading* menu affects vertical line spacing:

the value in the green *global* box affects all the line spacing in the current text box.

the value in the green *current* box affects the line spacing of the currently selected line (ie at the cursor position). Ticking the box allows you to manually drag the space using the 'I' cursor in the text box.



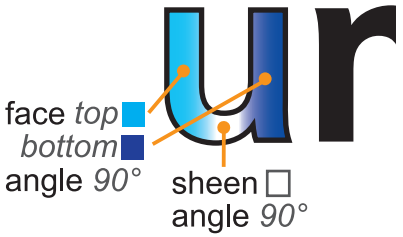
Face Menu

The *face* menu allows the fill colour of the text to be set as a single colour, a 2 colour gradient or a 4 colour gradient; select *one, two* or *four* from the *colours* scroll box. You can transfer colours from the Colour Palette to the colour pots that appear; toggle the palette on/off by pressing <F2> on the keyboard.

Note that with *two* selected, you can also choose the ratio of the two colours by changing the *top* and *bottom* values then define an *angle* to rotate the colours (but not the text).

The green *opacity* box defines the transparency of the text (100% is fully opaque and 0% is fully transparent).

Sheen Menu



The *sheen* menu allows a coloured highlight to be applied to the face of the text.

You can transfer a highlight colour (the default is white) from the colour palette to the *colour* pot then specify the *size* and *opacity* of the highlight within the text.

The *distance* value controls the highlight's distance from the text edge and the *angle* value controls the rotation of the highlight (but not the text).

Edge Menu

The *edge* menu allows a coloured outline to be applied to text characters. The *size* box controls the thickness of the outline and the *colour* pot defines the outline colour. The *opacity* value controls how transparent the outline is.

Solid Menu

The *solid* menu adds an extruded 3D effect behind the text face. The *size* box defines the depth of the extrusion and the *angle* box defines its angle from the face. The *colour* pot defines the colour of the extrusion.

Shadow Menu

The *shadow* menu creates a shadow behind the text. The *distance* box defines the distance it is positioned from the text; *opacity* defines the shadow's transparency; *angle* defines the shadow's offset position from the text and the *softness* box defines the blur/feathering of the shadow. Enter a *size* value to make the shadow larger or smaller and use the *colour* pot to change the shadow colour.

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Blur Menu

The *blur* menu allows you to use either a *vertical* blur on the whole text object, or a *chroma* blur affecting the face colours of the text.

Plugins Process

Important Notice

IMPORTANT: Only V4.2 plug-ins are compatible with V5.0 software. V4.1 plug-ins ARE NOT compatible; new versions of plug-ins need to be obtained from your plug-in providers BEFORE UPGRADING. Providers are aware of this issue and have provided any support required to enable compatible versions to be produced. Quantel are not responsible for the availability of specific plug-ins.

Plugins are accessible for video tracks and video segments within MLT FX. Select the clip segment or video track that you want to change, then select the *plug-ins* box on the left of the *mlt fx* menu area.

The blue *-off-* scroll box on the left allows the plugin provider to be selected. If you select *Quantel*, a *select:* scroll box appears below allowing you to choose a plugin from the list. The menu now displays the functions and options for this plugin.

The main (first) clip to be processed by the plugin is the currently selected clip segment or video track. If the plugin requires an additional (second) clip, drag and drop it onto the '*no clip selected*' box; this now displays the name of the loaded clip.

The currently selected plugin with parameters can be added to a 'holding' area by selecting *favourites* then holding down the cursor over an empty grey box. Select existing plugins by pressing *favourites* followed by the box holding the plugin name. Any existing favourite can be removed by pressing the *delete* box followed by the plugin that you want to remove from *favourites*.

You can save plugin parameters into the Settings Bin if required. The plugin process can be disabled by scrolling the plugin provider box to *-off-*.

See the 'Utilities & Plugins Guide' for details of Quantel Plugins.

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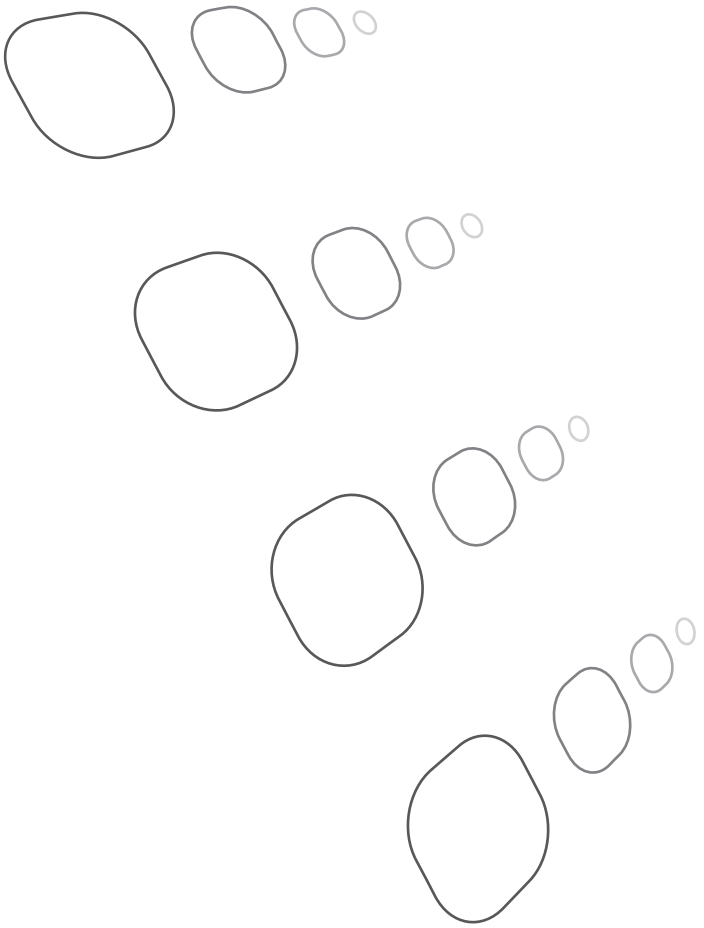


4

Tracking Points

The tracker function can be used to record the path of a point, multiple points or a whole shape throughout a segment.

Tracking data can be used to create a shaped effect or be applied to an existing shape, plug-in or DVE effect.

Tracker Function

Overview

The tracker function allows you to record the movement of a single point, multiple points or a shape through a segment of video.

After recording a track, the data can be applied to a shape or an effect created in an MLT FX process menu or it can be used to create a shaped effect. This means the shape or effect follows the movement of the point(s) recorded through the video segment.

The tracker data can be used in a number of MLT FX process menus including *dve, key – garbage, graphics, blur – shaped, colour – selective – shaped* and *plug-ins*.

Tracking Stereo Media

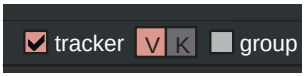
To track stereo media, you must select one eye only in the Edit Window.

Use the eye selectors (*L* and *R*) below the Edit Window to select either the left or right eye before creating a track.

If the eye selection is changed after tracking, the active tracking data is transferred to the newly selected eye.

Tracker Menu

Opening & Closing the Tracker Menu



To open the tracker menu, select the *tracker* box under the Edit Window.

The tracker menu opens to the right of the *mlt fx* process stack. Any existing effects created in the MLT FX process menus can be reordered or disabled while the tracker menu is open. The tracker menu has two main sections: the left section displays the tracker settings and the right section displays the point settings.

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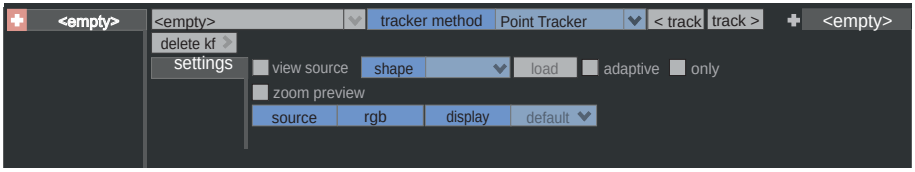


To close the menu again, simply deselect the *tracker* box under the Edit Window.

Tracker Settings

View Source Option

The *view source* tick box allows you to choose whether or not you want to view the source image with the effects turned off when the tracker menu is open. For example, if a circle has been inserted from the *graphics* menu and you select *view source*, the circle is not visible in the Edit Window but still exists.

Zoom Preview Option

The *zoom preview* tick box allows you to choose whether or not you want to use a miniature zoom when you're placing a point to track. It is selected by default. When you have zoomed in to a high level on the Edit Window, the *zoom preview* option is automatically turned off.

See 'Setting Points to Track' for more details about placing points.

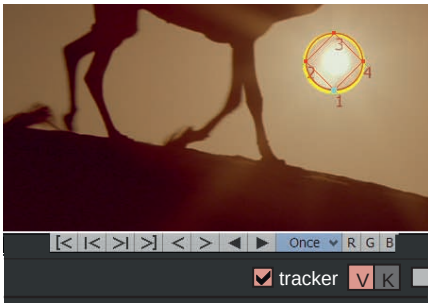
Tracker Method

There are two tracking methods available: *Point Tracker* and *Mocha Tracker*. You can select the required method from the scroll box to the right of *tracker method*.

See 'Point Tracker' and 'Mocha Tracker' later in this chapter for more details.

Loading & Converting a Shape Automatically

All shapes (except for *curves*) have to be converted to a curve to be able to track them. The tracker function allows you to load a shape and automatically convert it to a curve with set points ready to track. Any shape created in MLT FX can be automatically converted.



To convert a shape to a curve with points set automatically you must first ensure all of the following:

a Any objects that have been grouped together are split.

b Only one object is selected.

c The object you want to convert is currently selected.

If one or more of these items are not correct, an error message displays and the shape is not converted.

To load a shape and automatically convert it, do the following:

1 Select the shape you want to convert.

2 Tick the *tracker* box under the Edit Window. This opens the tracker menu, automatically converts the shape to a curve and automatically places the points to track.

When a shape has been converted into a curve, the name of the track is automatically updated to use the name of the shape with the prefix ‘cv.’

For example if you convert a circle to a track, the name of the track becomes ‘cv.circle’.

This can then be renamed by clicking on it, typing a new name and pressing <Enter>.

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Loading & Converting a Shape Manually

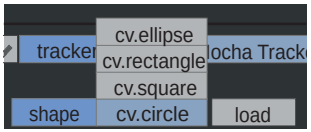
To load a different shape in the Edit Window with automatically set points for tracking, the shape must be previously converted into a curve.

This can be done in two ways:

a Using the automatic conversion (see previous section 'Loading & Converting a Shape Automatically').

OR

b Selecting the shape in the menu it was created in, eg *graphics,* and then pressing *transform – to curve*. See 'Graphics Process – Changing Shapes To Curve' in chapter 3 for more information.



To load a shape using the tracker menu do the following:

1 Ensure the shape you want to select has already been converted into a curve.

2 Select a shape from the *shape* scroll box.

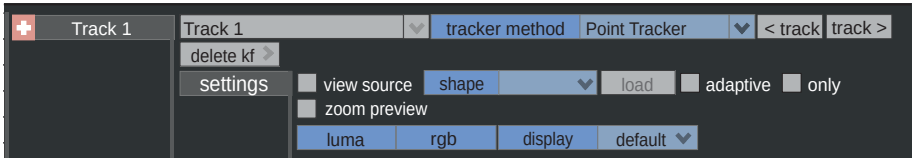
3 Press *load*. The shape track now appears in the Edit Window.

If you delete the original shape, the associated track is also deleted. If you make any changes to the original shape with the tracker menu, the changes are reflected in the track.

Point Tracker

The *Point Tracker* method tracks the movement of one or multiple specified points through the video segment.

Point Tracker Menu Settings



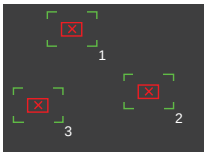
The box on the right of *luma* displays the selected luma channels being tracked. This is controlled by the *R*, *G* and *B* buttons under the Edit Window. By default, none of the channels are selected which means all the channels are being used. If one of the luma channel boxes is selected under the Edit Window, the *luma* box in the *tracker* menu displays the selected channel, eg *red*.

Ticking *adaptive* updates the search pattern at each frame in the clip to improve tracking on fast moving and fast changing images.

Ticking *only* tracks only the current point.

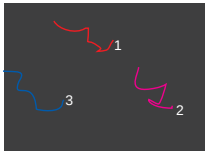
The *display* scroll box allows you to choose how you want set points to be displayed as follows:

default



The *default* option displays the match area (the inner red box with the 'x'), the search area (the area within the green brackets) and the number of all the points.

all



The *all* options displays the tracking paths that the points follow over the segment of video. This can only be displayed after the points have been tracked.

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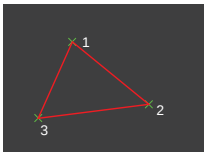
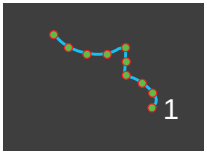
linked



The *linked* option displays the points connected in order.

track edit



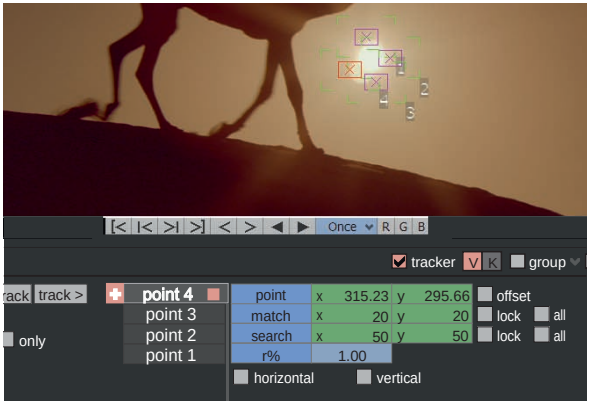
The *track edit* option displays the path and keyframes of the currently selected point. This can only be displayed after the points have been tracked. By default, only 10 keyframes are displayed.

When you select the *track edit* option an *all* tick box appears which can be selected to show all the keyframes.

The keyframes can be dragged and dropped in different positions and the changes are then reflected in the track.

Setting Points to Track

To set a point for tracking:



1. Ensure the '+' is selected to the left of the points listed in the stack.
2. Hover the cursor over the Edit Window.
3. Click once.

To insert additional points simply repeat the procedure.

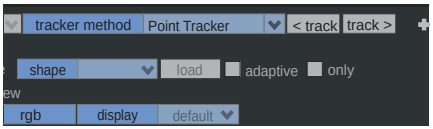
To place the point more accurately press and hold the cursor to display a

temporary miniature zoom over the target area. When you release the cursor the miniature zoom disappears. If you do not want to use a miniature zoom, deselect the *zoom preview* tick box in the *tracker* menu.

See 'Tracker Settings – Zoom Preview Option' for more details.

After the points have been placed in the Edit Window, they are listed in the stack in the tracker menu.

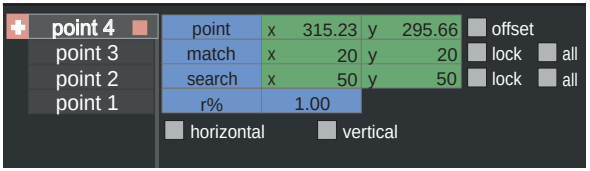
Tracking Points



You can track the selected points either forwards or backwards. Press either *track* > or < *track* to the right of *tracker method* (depending on the direction in which you want to track).

This tracks the points to the beginning or end of a segment. After you press *track*, it toggles to *stop*. Press this at any time to stop the tracking. You can also press <spacebar> on the keyboard to stop the tracking process.

Point Settings



The settings for the currently selected point are displayed to the right of the points list.

The *point* setting displays the *x* and *y* positions of the selected point. You can change these by adjusting the values in the green boxes or by adjusting the points manually.

See 'Moving & Re-ordering Track Points' later in this chapter for more details about how to move points manually.

Ticking *offset* allows you to select a second tracking point to track. The difference is then applied to the currently selected point. For example, if one of the points you are tracking goes off the screen, you can tick *offset* to select another point to track that doesn't go off the screen. The difference is applied to the original point, allowing the original point to be tracked off screen.

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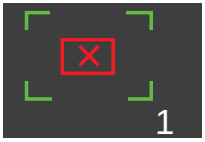
If you want to offset multiple points, you must offset each point individually, ie select *offset* for each point. Note that you do not need to have the same number of offset points as the original; there can be the same number or less.



The *match* setting allows you to adjust the dimensions of the area you are tracking (within the inner red box with an 'x').

The *search* setting allows you to adjust the area in which to search for a *match* (marked with the green brackets).

Select *lock* to the right of the *match* and *search* settings to lock the *x* and *y* values together, forcing them to have the same value. For example, if you change the value of *x* to 20 when lock is selected, the value of *y* is automatically changed to 20.

Select *all* to the right of the *match* and *search* settings to apply the settings to all the points simultaneously.

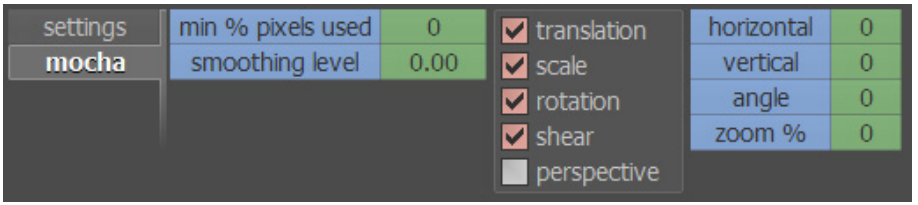
You can choose to track only the *horizontal* or *vertical* movement of a point. To do this select the movement that you want to track using the tick boxes. For example to track only the vertical movement of a point, tick *vertical*.

Mocha Tracker

The *Mocha Tracker* method tracks the movement of a whole shape specified with points (minimum of 3 points connected) through a video segment. This is also known as a Planar Tracker.

Mocha Settings Menu

After selecting *Mocha Tracker* from the *tracker method* scroll box, select *mocha* in the tracker menu to access additional settings.



min % pixels used — Allows you to define the percentage of pixels used in the track. If you leave this as 0, it uses the Mocha default. The higher the percentage, the slower the tracking process becomes but it can improve the quality of the track.

smoothing level — Allows the track process to be smoothed by blurring the original image before tracking. For example, if the track is jittery, set the smoothing level to a high number to blur the jittering, which provides a smoother track.

The tick boxes give you the option of what processes to track. Note that these are accumulative from *translation* to *perspective* and cannot be ticked individually. The more processes you select to track, the slower the tracking process is.

translation — Tracks only the movement of *x* and *y* positions of the shape.

scale — Scales/resizes the shape throughout the track.

rotation — Adjusts the angle of the shape if it rotates.

shear — Tracks any distortion in the shape if it turns away from or towards the camera.

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perspective	Adjusts the shape if it moves in perspective relative to the camera.
horizontal	Sets the maximum *x* movement in pixels allowed by the tracker per frame, eg if *x* is set to 10, *x* can only move a maximum of 10 pixels left or right per frame. 0 means no value is set.
vertical	Sets the maximum *y* movement in pixels allowed by the tracker per frame, eg if *y* is set to 10, *y* can only move a maximum of 10 pixels up or down per frame. 0 means no value is set.
angle	Sets the maximum angular rotation in degrees allowed per frame. 0 means no value is set. Setting a maximum angle rotation is used only if there is a high shape rotation in the track.
zoom	Sets the maximum scaling in percent allowed per frame, eg if the zoom is set to 10, a shape can only be scaled 10 % larger or smaller per frame.

Setting Points to Track

The points for tracking are set in exactly the same way as in *Point Tracker* method; ie by clicking in the Edit Window.

When you place points using the *Mocha Tracker* method, the points are automatically joined to form a whole shape.

A Mocha Tracker must have at least 3 points in order to function.

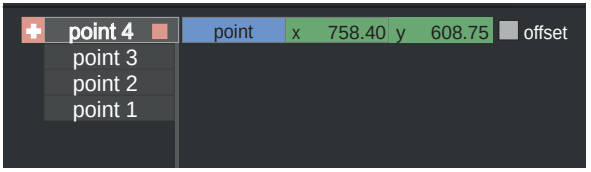
Tracking Points

You can track the selected points either forwards or backwards. Press either *track* > or < *track* to the right of *tracker method* depending on the direction in which you want to track.

This tracks the points to the beginning or end of a segment. After you press *track*, it toggles to *stop*. You can press this at any time to stop the tracking. You can also press <spacebar> on the keyboard to stop the tracking process.

During the track, the shape effect does not appear to move or change but the wire frame of the track does. After the tracking is complete the shape movement is updated throughout the video segment.

Point Settings



The *point* setting displays the *x* and *y* positions of the selected point.

You can change these by adjusting the values in the green boxes or by adjusting the points manually.

See 'Moving & Re-ordering Track Points' for more details about how to move points manually.

Ticking *offset* allows you to select a second tracking point to track, which then applies the difference to the currently selected point. If you want to offset a whole shape you must offset each point individually, ie select *offset* for each point. Note that the offset shape does not need to have the same number of points; it can have the same number or fewer than the original shape.

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Moving & Re-ordering Track Points

Moving Track Points

You can move existing track points either before or after tracking. Any changes made to points after being tracked are automatically updated and reflected in the track. To move a point do the following:

1. Deselect the '+' to the left of the list of points in the tracker menu.
2. Select the point you want to move from the list (you can only move the currently selected point).
3. Move the point using one of the following methods:
    - **a** In the Edit Window, click on the new location for the point.
    - **b** Select the point and drag it to the new location.

    OR

    - **c** Change the *x* and *y* values in the green boxes to the right of the list of points.

Re-ordering Track Points

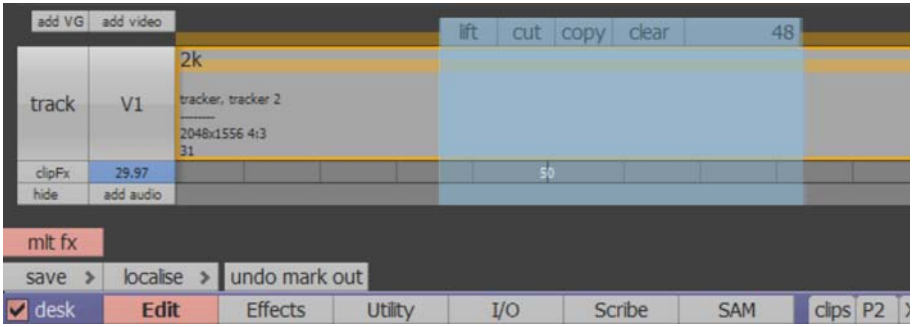
Points can be re-ordered before or after being tracked. When points are re-ordered after being tracked, the track data is automatically updated.

To re-order track points, use the list of points in the tracker menu. Simply move one of the boxes, eg point 4, up or down the list, eg below point 2. The point numbers change accordingly and the tracking data is automatically updated.

Tracking a Section of a Segment

You can use the tracker function to track a specified section of a segment as follows:

1 Insert 'in' and 'out' points of the section you want to track. (Do this by either using the <i> and <o> keys on the keyboard or click on the timeline and use the *in* and *out* buttons.)



2 Place the timeline cursor where you want to begin tracking.

3 Press either *track* > or < *track* according to the direction in which you want to track. This now tracks to either the in or out point of your marked section.

Saving Points & Tracks

Points and tracks are automatically saved when you create them. Before any points are set, the track name displays *<empty>*. When points are set, the track is automatically saved with a default name, eg *track 1*.

When tracking stereo media, the default track name includes a prefix signifying which eye has been tracked, eg *L track 1* signifies the tracking data has been recorded on the left eye.

You can change the name of the saved track by pressing on *track 1* and using the hard keyboard to enter a new name or by pressing on the arrow to the right of it and using the soft keyboard to enter a new name.

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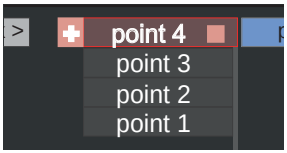
Deleting & Modifying Keyframes

Deleting Points & Tracks

To delete a whole track, press *delete* in the top-left of the menu area and then click on the track name you want to delete. The track is deleted immediately.



To delete a point in a track, select *delete* in the top-left of the menu area (or *delete kf* in the *tracker* menu) and then click on the point you want to delete either from the list of points on the right side of the *tracker* menu or in the Edit Window.

Deleting Track Keyframes

The *tracker* menu allows you to delete one, a selection or all keyframes of a track.

Press *delete kf* to show all the options.

Deletes the current keyframe of the currently selected point. You can delete the current frame for all the points by pressing *all* then *current*.

Deletes all the keyframes of the selected point in the selected track, to the left of the current timeline cursor position.

Deletes all the keyframes of all points in the currently selected track to the left of the current timeline cursor position (first press *all* and then the direction you want to delete).

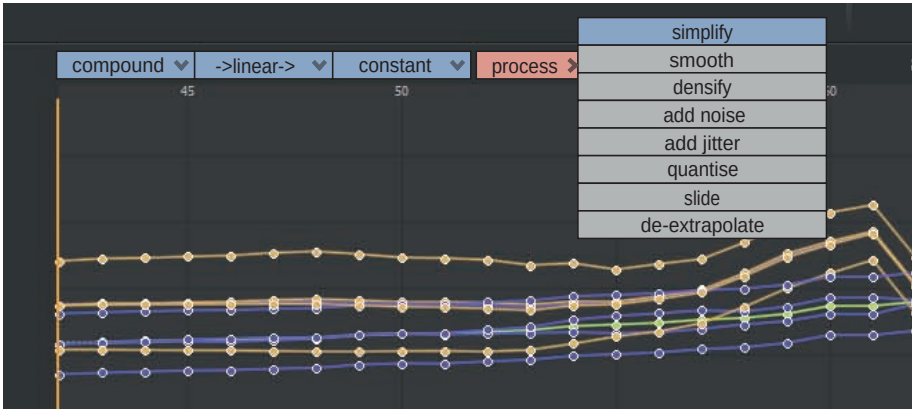
Deletes all the keyframes of the selected point in the selected track, to the right of the current timeline cursor position.

Deletes all the keyframes of all points in the currently selected track to the right of the current timeline cursor position (first press *all* and then the direction in which you want to delete).

all points	Deletes the keyframes of all points in the currently selected track, therefore deleting the track.
all tracks	Deletes all keyframes of points in all the tracks, therefore deleting all the tracks.

Modifying Keyframes

Keyframes can be modified to adjust the points within a track or the whole track itself. A row of nodes represents the keyframes for one point. Each node can be deleted or dragged to a different position which is then reflected in the tracking data displayed in the Edit Window.



You can use the keyframe *process* options to adjust the tracking path, eg selecting *smooth* makes the movement of the track smoother.

See 'Using Keyframes' in chapter 2 for a full description of keyframe functions.

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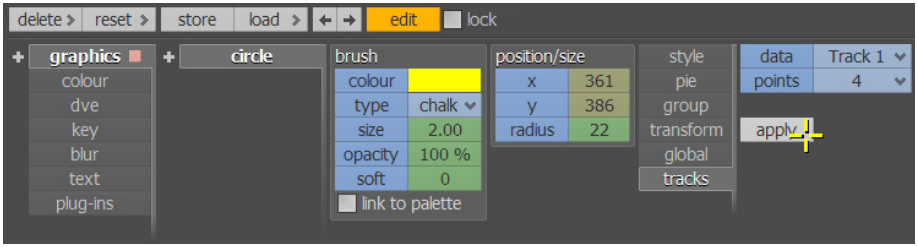
Using a Track

Applying a Track to an Existing Shape or Effect

When you have created a shape or shaped effect you can use the *colour*, *key*, *blur* and *graphics* process menus to apply tracking data from a selected point.



To apply a track to a shape in the *graphics* menu do the following:

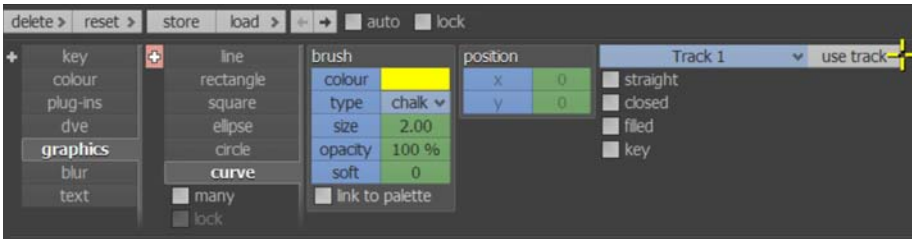
1. Select the shape in the *graphics* menu that you want to apply the track to, eg *circle*.
2. Use the *data* scroll box to select the track you want to apply, eg *Track 1*.
3. Select the point tracking data you want to apply from the *points* scroll box. In all menus except *dve*, the tracking data that is applied is from the single point selected from this scroll box.
4. Press *apply*. The shape now moves with the applied track through the video segment.

When you apply tracking data, it is applied from the current frame on the timeline, ie the applied tracking data ignores the original frame numbers.

Using a Track to Create a Shape or Effect

Tracking data can be used in the *colour*, *key*, *blur* and *graphics* process menus to create a shape or a shaped effect which then automatically follows the tracking data.

For example, in the *graphics* menu create a shape by doing the following:



1. Select the required menu, eg *graphics.*
2. Select the shape you want to create, eg *curve* (you can only select *curve* or *line*).
3. Use the track scroll box to select the track you want to use.
4. Press *use track*.

Creating a shape or shaped effect uses the original keyframe data that was generated from the track, ie the data is applied to the same frames.

Creating a line requires tracking data with at least 2 points and creating a curve requires tracking data with at least 3 points. If the tracking data does not contain the required number of points for the shape you are creating, the use track button is not available (ie, greyed out).

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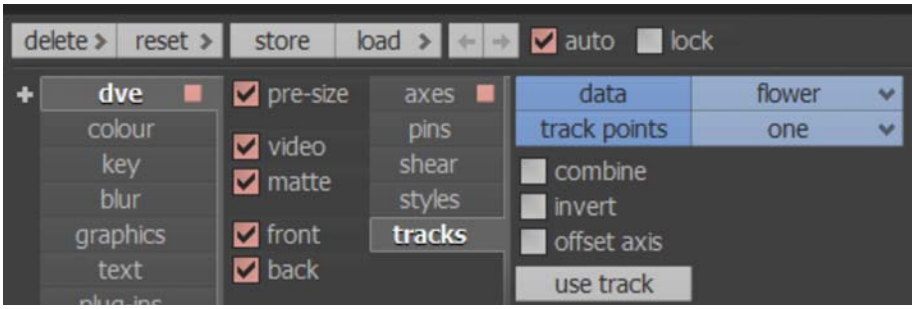
Using a track with DVE

Applying Tracking Data

You can use tracking data to create a new *axes* or *pins* effect or apply it to an existing *axes* or *pins* effect.

To apply a track to *axes* or *pins*, do the following:

1 Select *dve – tracks.*



2 The name of the track automatically appears in the scroll box to the right of *data*. If there is more than one track available, use the scroll box to select the required track.

3 To apply the track settings to *axes* only select *one* point in the scroll box to the right of *track points*. To apply the track settings to *pins* select *four* points from the scroll box to the right of *track points*.

4 Press *use track*.

When you apply tracking data, it is applied from the current frame on the timeline, ie the applied tracking data ignores the original frame numbers.

1 Point Tracking/Image Stabilisation

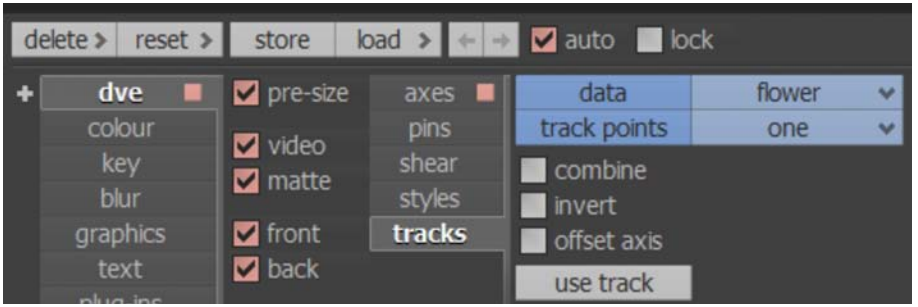
1 point tracking data can be used to stabilise horizontal and vertical movement artefacts that are detected between the target and a fixed point on the screen (the position of the target on the first frame of the clip). This is useful where the foreground image needs to follow only horizontal and vertical movement of the track point, eg to allow a foreground clip to follow the vertical and horizontal movement of a track point on the background clip:

To stabilise an image do the following:

1. In the *tracker* menu, select a suitable point on the clip to stabilise. The point (target) chosen should have both horizontal and vertical image detail and be an element (for example a building) that is fixed horizontally and vertically.

2. Press either *track* > or < *track* depending on the direction in which you want to track. The track is automatically saved and you can rename it by pressing of the default name (ie *Track 1*).

3. Close the *tracker* menu and select *dve – tracks.*



4. The renamed track appears automatically in the *data* scroll box. If there are multiple tracks use the *data* scroll box to select the required track.

5. Ensure *one* is selected from the *track points* scroll box.

6. Select *invert* followed by *use track* to stabilise the movement in the image.

For major movement artefacts the stabilised clip can be resized and repositioned as required.

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When 2 layers with 2 different tracking paths need to be stabilised together, tick the combine box and select the track data (that you want to combine) from the second scroll box that appears to the right of data. This stabilises a second layer to the first.

The *offset axis* box allows the foreground image to be offset from the tracking point. The *axis only* box allows the axis to follow the tracking point while the images remain fixed.

2 Point Tracking

This is useful where the foreground image needs to follow horizontal and vertical movement, size change as well as rotation between the two track points. To use 2 point tracking data in *dve*, select 2 points from the scroll box to the right of *track points* in the *tracks* menu.

4 Point Tracking

This is used to track four points (normally a rectangle) on the background clip and create a tracking path with horizontal and vertical movement, size change, rotation and change in perspective. To use 4 point tracking data in *dve*, select 4 points from the scroll box to the right of *track points* in the *tracks* menu.

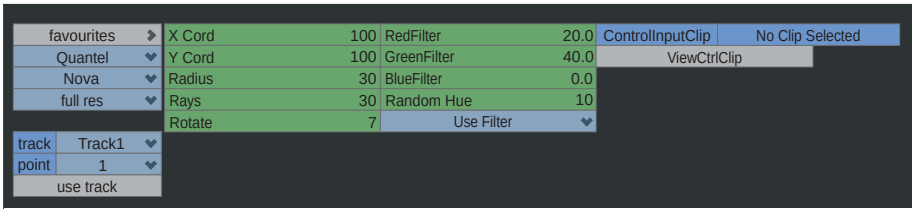
The *pin offset* box allows the position of the four corner points on the foreground video track to be moved from their default positions. This is useful if they need repositioning or if the foreground image needs to be larger than the area defined by the tracking points.

When using tracking data with DVE corner pins, you must ensure the first point of the track is in the top-left corner with subsequent points placed in a clockwise direction. The points can be re-ordered to achieve this: see 'Moving & Re-ordering Track Points' for more details.

Using a Track with Plug-ins

Applying a Tracker Data

You can use tracking data with a number of plug-ins including Crash Zoom, Kaleidoscope, Magic Crystal, MeshWarp, Nova, Ripple, Transition and Whirl Pinch. When you open the *plug-ins* menu a new track settings menu appears.



To apply a track to a plug-in do the following:

1. Select the plug-in you want to use, eg *Nova*.
2. Adjust the plug-in settings accordingly.
3. Select the track you want to apply from the *track* scroll box.
4. Select the point tracking data you want to apply from the *points* scroll box. The tracking data that is applied is from the single point selected from this scroll box.
5. Press *use track*. The plug-in effect now uses the movement of the selected track. You can adjust points and change the track by selecting the new track from the track scroll box and press *use track* again.

When you apply tracking data, it is applied from the current frame on the timeline, ie the applied tracking data ignores the original frame numbers.

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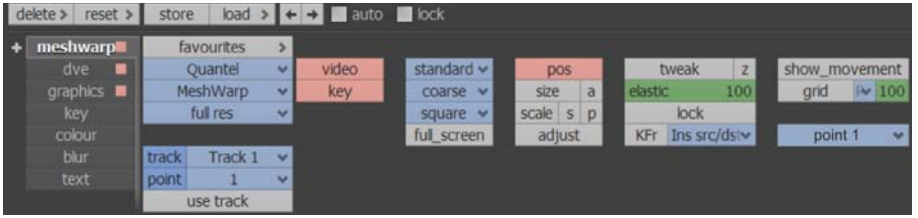
Using a Track with MeshWarp

When you are using a track with the *MeshWarp* plug-in, the method for applying tracking data differs slightly.



MeshWarp has its own track point selection scroll box in the bottom-right of the menu.

To apply a track to *MeshWarp* do the following:

1. After selecting *MeshWarp* and adjusting the settings as required, select the track you want to use from the scroll box to the right of *track* in the bottom-left of the *plug-ins* menu area.

2. Select the point tracking data you want to apply from the scroll box to the right of *point* in the bottom-right of the *plug-ins* menu area. The tracking data applied is from the single point selected from this scroll box.

You do not need to press *use track* when first applying tracking data to *MeshWarp*. If you select a different track from the scroll box to the right of track, you must press *use track* to apply it.

Tracker Settings Clips

Tracker settings clips can be used in the *colour – shaped*, *key – garbage*, *graphics, blur – shaped, plug-ins, dve – axes* and *corner pins* processes. There are two ways tracker settings clips can be used:

a Creating a shaped effect (*line* or *curve*) using the tracking data.

b Applying the tracking data to an existing shape or shaped effect.

c Using the tracking data to create 1, 2 and 4 point *dve* effects.

Behaviour of Settings Clip Types

There are three types of tracker settings clips that can be used in any of the MLT FX process menus (except *text*): MLT FX settings clips, Effects settings clips and Mocha exported corner pin XML files.

Loading Different Track Types

Different types of tracker settings clips are loaded in different ways:

MLT FX settings clips	Drop clip onto the Edit Window.
Effects settings clips & XML files	Drop clip onto the track box in the required MLT FX process menu.

Naming of Loaded Tracks

The name of the tracking data displayed in the process menu depends on the type of tracker settings clip used:

MLT FX settings clip	Uses the name from the title of the track(s) within the settings clip.
Effects settings clip	Uses the name from the title of the settings clip.
XML file	Uses the name from the title of the XML file.

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Using Tracker Settings Clips to Create a Shape

You can use tracker settings clips to create a shape (*line* or *curve*) or a shaped effect in the *colour*, *key*, *blur* and *graphics* process menus.

To create a shaped colour effect do the following:

1 Select *colour – shaped*.

2 Select *line* or *curve*. A blue box appears with a *use track* box to the right of it which currently has no data. The *use track* box is unavailable (ie greyed-out) as there is currently no tracking data to use.

3 Open the Settings Bin and locate the tracker settings clips you want to use.

4 Drag and drop the tracker settings clip onto the Edit Window. The blue box now updates with the name of the track. See ‘Behaviour of Settings Clips Types’ previously for details of loading different settings clips.

5 Press *use track*. Creating a *line* requires tracking data with at least 2 points and creating a *curve* requires tracking data with at least 3 points. If the tracking data does not contain the required number of points for the shape you are creating, the use track button is not available (ie greyed out).

MLT FX tracker settings clips may contain more than one track. In this case all tracks appear in the blue scroll box when the clip is dropped on the Edit Window. Select the track you want to use from the scroll box and then press *use track*.

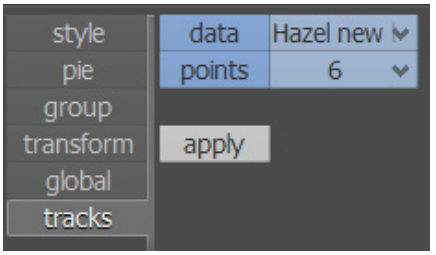
Applying a Tracker Settings Clip

You can use different types of tracker settings clips in *colour*, *key*, *blur* and *graphics* to apply to a shaped colour effect.

The following example demonstrates how to use an MLT FX settings clip.

To apply a tracker settings clip to a shaped colour effect, do the following:

1. Select the existing colour effect from the existing shape stack.
2. Open the Settings Bin and locate the tracker settings clip you want to apply.
3. Drag and drop the tracker settings clip onto the Edit Window. A new track box appears under the shape options stack. See 'Behaviour of Settings Clips Types' previously for details of loading different settings clips.



4. Press *tracks*. The name of the track should be displayed in the scroll box to the right of *data* (if there is more than one track, select the track from the blue scroll box).
5. Select the number of the point you want to apply the tracking data from using the scroll box to the right of *points*.
6. Press *apply*.

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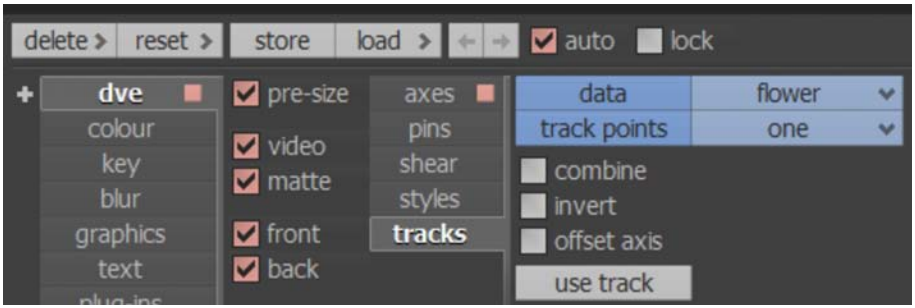
Using a Tracker Settings Clip in DVE

You can use a tracker settings clip to create a new *axes* or *pins* effect or apply it to an existing *axes* or *pins* effect.

To apply a tracker settings clip to *axes* or *pins*, do the following:

1 Select *dve – tracks.*



2 Open the Settings Bin and locate the tracker settings clip you want to use.

3 Drag and drop the tracker settings clip onto the Edit Window. The name of the track automatically appears in the scroll box to the right of *data*. See 'Behaviour of Settings Clips Types' previously for details of loading different settings clips.

4 Ensure the track you want to use is currently selected in the scroll box to the right of *data*. If there is more than one track in the settings clip, use the scroll box to select the required track.

5 To apply the track settings to *axes* only select *one* point in the scroll box to the right of *track points*. To apply the track settings to *pins* select *four* points from the scroll box to the right of *track points*.

6 Press *use track*.

See 'Using a Track with DVE' in the previous section for more details of using 1, 2 and 4 point tracking.

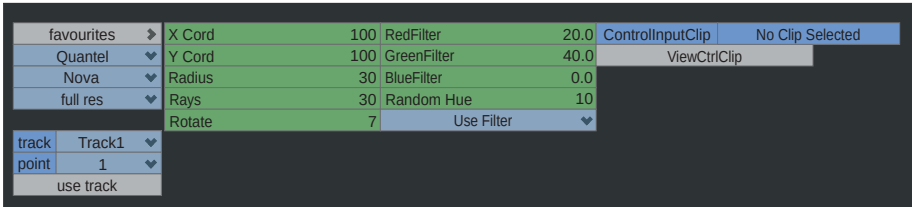
When using tracking data with DVE corner pins, you must ensure the first point of the track is in the top-left corner with the following points placed in a clockwise direction. The points can be re-ordered to achieve this: see 'Moving & Re-ordering Track Points' for more details.

Using Tracker Settings Clips in Plug-ins

A tracker settings clip can be applied to a number of plug-ins including Crash Zoom, Kaleidoscope, Magic Crystal, MeshWarp, Nova, Ripple, Transition and Whirl Pinch.

To apply a tracker settings clip to a plug-in do the following:

1. Select *plug-ins* and then the plug-in you want to use, eg *Nova*.
2. Adjust the plug-in settings as required.
3. Open the Settings Bin and locate the tracker settings clip you want to use.
4. Drag and drop the tracker settings clip onto the Edit Window. The track name automatically appears in the box to the right of *track* in the *plug-ins* menu See 'Behaviour of Settings Clips Types' previously for details of loading different settings clips.



5. Select the point tracking data you want to apply from the *point* scroll box. The tracking data that is applied is from the single point selected from this scroll box.
6. Press *use track*. The plug-in effect now uses the movement of the selected track. You can change the point or the track by using the *track* and *point* scroll boxes and pressing *use track* again.

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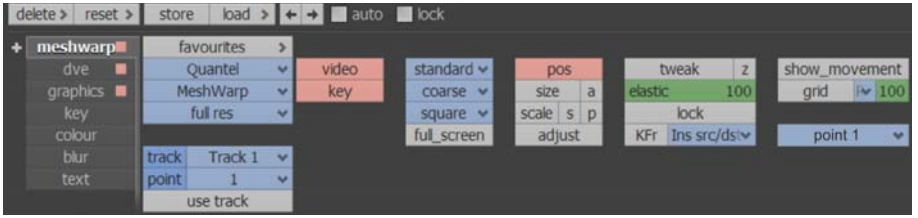
Using a Tracker Settings Clip with MeshWarp

When you are using a tracker settings clip with *MeshWarp*, the method for applying a settings clip differs slightly.



MeshWarp has its own track point selection scroll box in the bottom-right of the menu area.

To apply a tracker settings clip to *MeshWarp* do the following:

1. After you have selected *MeshWarp,* adjust the settings as required.

2. Open the Settings Bin and locate the tracker settings clip you want to apply.

3. Drag and drop the tracker settings clip onto the Edit Window. The name of the track automatically appears in the box to the right of *track*. See 'Behaviour of Settings Clips Types' previously for details of loading different settings clips.

4. Select the point tracking data you want to apply from the scroll box in the bottom-right of the *MeshWarp* menu area. The tracking data that is applied is from the single point selected from this scroll box.

You do not need to press *use track* when first applying tracking data to *MeshWarp*. If you select a different track from the scroll box to the right of *track*, you must press *use track* to apply it.

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Note that main entries starting with a lower case letter may indicate a sub-menu or panel function (eg **hue**).

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